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The JOURNAL *of*
SPEECH DISORDERS

Volume 6 DECEMBER, 1941 Number 4

THE SPEECH CLINICIAN AND COMMUNITY SERVICE

SARA STINCHFIELD-HAWK, Ph.D.

At no time in the history of speech correction have there been so many opportunities for service and so many community needs to be met as today. The harvest is rich, but the workers are all too few. In discussing a subject of such magnitude as the field of speech pathology, one must limit the boundaries to that which is most immediately useful, and which may be based largely upon personal observation and experiences.

The forms of service which our profession is called upon to give may be summarized as follows: (1) the university clinic or laboratory, usually in speech or psychology; (2) special classes in public school systems or in private schools; (3) Child Guidance Clinics offering this special type of remedial service, through the National Mental Hygiene Committee; (4) hospital speech clinics; (5) private, individual work or studio instruction.

The University Speech Clinic. This type of speech service has an extensive history in this country. Beginning with the early part of this century with the pioneer work of Scripture at Yale and Columbia, of Twitmeyer at Pennsylvania, Kenyon at Rush and University of Chicago; somewhat later being followed by the work of Blanton at Wisconsin, Fletcher at Tulane, Stivers at the Orthopaedic Hospital in Los Angeles, Dunlap at Johns Hopkins, Goldstein in St. Louis. Then came the educational movement, with Martin in New York, Robbins and Swift in Boston, Russell in Columbus, Orton's work on Aphasia in the east; Harvey Fletcher's work on acoustics in industry; state directors Gifford and Camp in California and Wisconsin state departments of education. Following this came the development of university speech departments specializing on the speech science side, and special classes were offered in many school systems throughout the country. It would be impossible to name all of these, but the laboratories of the departments at Iowa, Minnesota, Wisconsin, Utah, Yale, Tulane, Michigan, Cornell, New York University, Colleges of the City of New York, Columbia, Texas, Denver, Purdue, Wichita, Missouri, Northwestern, Indiana State Teachers College, Penn State,

Pennsylvania and University of Southern California are some of our outstanding centers which have developed within the last decade.

Public school classes. In public or in private schools speech correction is usually handled by one or more teachers special trained in speech pathology and techniques. The methods vary with the training of the teacher and the philosophy of the director. Due to the large numbers of children treated, much of the work is given in groups, some time being allotted usually for individual work with the more difficult cases, as in Los Angeles, where no teacher may take more than eight children at one time. We still have too few teachers to carry the load in almost every city. Detroit and New York probably lead with over thirty teachers in speech correction alone. Then come Philadelphia, Chicago, Minneapolis, Pittsburgh, New Orleans, San Francisco, Los Angeles, Washington, Jersey City and Newark, while smaller systems have only one or more specialists engaged in such work.

Child Guidance Clinics. In a few cities under the direction of the National Mental Hygiene Committee, and particularly because of the interest of the psychiatrist and psychologists in such clinics, several Child Guidance Clinics have undertaken remedial work for the speech defect cases referred. This has been done in Springfield, Holyoke, Boston and vicinity, Los Angeles, New York and probably in other centers about which I am uninformed. The speech clinic director may receive a small fee for services, but the workers are usually graduate students from neighboring universities.

Hospital Speech Clinics. In the hospitals is a large and as yet comparatively undeveloped field for speech correction services. The work is usually on a voluntary basis, like that of the visiting doctors. Los Angeles, about twenty years ago began such work at the Orthopaedic Hospital under Dr. Stivers. Miss Chapin of Los Angeles schools and her teachers offered consultation service at the Children's Hospital. More recently a speech clinic has been added at the California Babies Hospital under Edna Hill Young, at Children's Hospital under Dr. Travis; research work on brain potentials is being studied at Cedars of Lebanon Hospital and the writer is continuing Dr. Stivers' former clinical work at the Orthopaedic Hospital. Dr. Fleda Brigham has also established a clinic at the L. A. Osteopathic Hospital. Consultation service is sometimes offered by any or all of the leaders of these clinics at the general hospital, on request, as in some cases of aphasia.

On the educational side, several states now require a speech credential, to certify a teacher for speech correction work in the schools. This is true of Wisconsin and California and I understand movements in this direction are under way in Illinois, New York State, Pennsylvania and Colorado as well as in the state of Washington. Speech is so important a function of the personality, that in some cities as in New York a speech test is required of all applicants for teaching positions.

Since these clinical fields are already familiar to most of you, let us pass on to less known and perhaps more immediately useful considerations, as to future needs in speech correction.

In foreign journals we are already hearing about nervous speech disorders, attendant upon warfare. During the World War of 1914–18 many cases of hysterical speech disorders passed through the port of Boston, and were described by Southard under the title *Shell-shock and Neuropsychiatry*. Following the war some of our members were actively engaged in speech therapy either in university or hospital speech clinics. Many bonus students were referred to the universities, and many veterans were given training in the veterans' hospitals. Because of a possible repetition of war conditions in this country, it seems worth while to review some of the findings and to discuss some theories as to causes, condition and types of therapy in use during the former war as well as those more recently developed in the treatment of war neuroses. Many changes have occurred in psychiatry in recent years, in definitions, in interpretation and in concepts of the neuroses and psychoses. We no longer speak of shell-shock, but of war-shock, and we find that many of the nervous patients during the War of 1914–18 were never subjected to bombardment, and never went beyond the officers' or regular training camps.

Previous to the last war, medical men, psychoanalysts and psychologists were inclined to accept the Freudian interpretation of the neuroses, but the reports on a great number of cases during wartime brought forth the fact that birth trauma and sexual drives had very little to do with the "nervous breakdowns." Dr. Eder, reporting on British army cases in the Gallipoli campaign stated that most of the cases came under the head of hysteria, anxiety neuroses and psychasthenia. The symptoms described by him are reported in Pillsbury's Psychology of the Abnormal, and they include paralyses, anesthesias, mutism, stammering, hysterical deafness and blindness, tics, tremors, respiratory and cardiac disturbances. Eder's therapy in many cases of deafmutism consisted of suggestion and hypnoses. Sometimes a mild anaesthetic was given and the patient was told that he would soon be able to talk. In other cases mere suggestion was used; when hypnosis was induced, the patient was told over and over again that upon awakening he would be able to talk. Other methods were rest cures, psychoanalysis, persuasion and re-education.

Another British physician, Yealland, described the punishment method, in which a mild electric current was used upon the patient, the strength of current being increased to the point of pain, to demonstrate to the patient that he could really use the supposedly paralyzed limb. Sometimes it was the larynx or voice box which was stimulated, to induce speech in a supposed mute or hysterical stutterer.

One of the best known writers, Kretschmer, maintained that at time of great stress and strain man tends to revert to more primitive types of behavior, and that the cortex gives way to thalamic and mid-brain reactions, on an emotional level. It is as though the

individual were in a border-line state and only partially responsible. Fear and anxiety override the power of self-criticism, and the person becomes hysterical. If he is greatly exhausted and worn down by prolonged strain and anxiety, he may have actual pain symptoms and become a neurasthenic. If the psychic symptoms such as sleeplessness, great restlessness, anxiety and mental tension predominate, he is called a psychasthenic. These forms of the psychoneuroses were found to be the basis of much hysterical mutism, stammering, stuttering and aphonia during the former World War. There is every reason to believe that in the present world conflict the mental and physical symptoms may be even more severe, because of mechanized warfare and greater hazards.

In this country the therapy consisted chiefly of rest, relaxation, recreation, physio-therapy, hydro-therapy, suggestion, occupational therapy and hospitalization for weeks or months. Hearty feeding, massage, mental and physical hygiene were important. It was recognized that these veterans had been uprooted by war conditions, that they could not readjust to civilian life, and could not succeed in their former occupations. Work therapy, physical training and habit re-education were stressed. This was true of speech cases as well as of other forms of psychoneuroses.

Just why there should be a disintegration of the speech function in peace or wartime is a matter of some complexity. Inheritance of a constitution which predisposes the patient to a neurosis is Adler's explanation. Blanton believes that there is an hereditary predisposition to stutter. Swann at Michigan substantiated this theory in her findings. The psychoanalyst often believes that the roots of the disorder are in the sexual life. Dunlap feels that it is the result of taboos placed upon certain words in a child's vocabulary, leading to stuttering whenever he starts to use these words and eventually spreading to many similar words. Orton and Travis stress preferential handedness and the cerebral dominance theory.

How might some of these breakdowns, frequent "nervous breakdowns," have been prevented? They are by no means cases of malingering, in the ordinary sense. They are really sick people. Possibly we might anticipate such breakdowns by screening out personality difficulties as they arise in childhood, by treating them at the source. It is a difficult matter however to distinguish, sometimes, between abnormal behavior, and normal or near-normal expression of the emotions. An odd personality is a suspicious symptom. Before any of us should undertake treatment or training with such individuals a neuropsychiatric examination should be given, especially in these war-shock cases, and the treatment must be in close co-operation with the doctor, the psychiatrist or the psychologist in charge.

Menninger describes the following types of personalities as those most liable to be referred to the psychiatrist and often found in our adult speech clinics, among nervous speech disorders:[1]

---

[1]Menninger, K., The Human Mind. F. Crofts Co. N. Y. 1931.

Crippled personalities as in organic disease.
Stupid personalities as of the hypophrenic type.
Lonely personalities of the isolation type.
Queer personalities of the schizoid type.
Moody personalities of the cycloid type.
Frustrated personalities of the neurotic type.
Perverse personalities of the antisocial type.

Although failure and disappointment are common to all mankind at various times, these personalities cannot accept defeat and take refuge in fantasy or unreality as in the common psychoses known as manic depressive insanity or dementia praecox, alcoholism, or drug addiction. If they remain orientated and in touch with essential realities, we say rather that they are psychoneurotic, as in hysteria, psychasthenia or neurasthenia. The stutterer is often an hysteric. He converts a mental conflict into a physical symptom. He substitutes an ethically inferior motive for an ethically superior one, according to Rosanoff. Emotion, conflict of personality patterns and indecision lead to speech disintegration and to blocked, crippled speech.

The psychasthenic or the neurasthenic is more liable to become the hysterical mute. In such cases, fear, doubt, anxiety, compulsion or obsession interfere with normal mental and physical activity and the individual can no longer adjust. The neurasthenic is found more often among officers than among ordinary soldiers, and there is often a basis for his neurosis because of prolonged strain, responsibility for his men, anxiety during bombardment, weakness, fatigue, aches and pains, following periods of intense activity and stress.

Treatment to maintain mental health is based upon the principle of expression, or the finding of satisfactory social, physical and mental outlets. It includes:[1]

1. The facing of reality honestly and without fear or rebellion.
2. Cultivation of social contacts and outlets.
3. Recognition of one's neurotic tendencies and re-direction of them into safe channels or by sublimation.
4. Recognition of mental disorder and learning how to deal with it.
5. Assuming that the unhappy are always wrong.

Occupational therapy should include:

Work. It is not so important what it is, at the moment, as that one works at something which one can do or can learn.
Re-education as to one's problems and how to manage them.
Mental hygiene and therapy.
Psychoanalysis.

In general the principles which apply to other forms of neurosis also apply to those in which there is a speech involvement in these nervous disorder cases, and the above methods may often be applied in conjunction with medical and psychiatric agencies.

Adolf Meyer has said that the chief aim of the study of man is the determination of his role in life and his range of operation; his relationship to others; his backgrounds; factors making for success or failure; health, happiness, efficiency and creativeness. He maintains that no specialist can afford to confine himself strictly to one field. The neurotic illnesses which we find in many speech defectives are due to failures in integration. Therapy must be directed toward restoring this integration of the individual and in reconstructing his personality. Many individuals never grow up emotionally. The speech clinic, like the psychological or psychiatric clinic, may play its part in preventing adult neuroses by helping children to grow up and to take responsibility, to attain unity of personality, or purpose and of action.

Some writers go so far as to say that since man stopped working with his hands, and manufacturing all of his own implements and materials, he has become neurotic. Neuroses leading to speech defects might then be explained on the basis of world deterioration. "We passed from the tyranny of kings to the tyranny of democracies, and from democracies to the tyranny of dictators, and if we save man from disease by hygiene, we may yet starve him to death through non-employment." Fear and hunger can destroy a world, according to the pessimist.

With the advance of science and the machine age, we have bigger and more destructive weapons; chemistry and aeronautics have reached new levels. With world-wide bankruptcy has come loss of nerve, loss of moral and economic values, insecurity, and fear of loss. Some believe that an international neurosis is underway and that society is at the cross-roads. We must honestly face the facts and by so doing may better understand the basis for neurotic tendencies. The physician tells us the body must be restored; the psychologist and the psychiatrist tell us that the mind and the personality must be restored; the semanticist tells us that we must get man to face facts and to mean what he says and say what he means. As a matter of fact, they are probably *all* right.

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A LABORATORY STUDY OF THE METALLIC VOICE[1]

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No two individuals have voices which are exactly alike in quality. Nonetheless, vocal qualities have been studied empirically and classified. Now, several descriptive terms are in use. Until recently, few attempts were made to determine the physical bases for differences between voices.

The purpose of this paper is to report a laboratory study of the physical aspects of voices of men and women which were classified as metallic,[2] and to compare the findings with those obtained in a similar study of voices classified as normal. Barnes[3] in a study of 759 University freshmen found that the voices of 27.2 per cent were metallic in quality.[4]

Characteristics of Cases

Four severely metallic voices and four normal voices were studied. The voices of two men and two women were studied in each classification—metallic and normal. The students whose voices were metallic were freshmen at the State University of Iowa, enrolled in a required speech course in which members were segregated according to needs and abilities in speech and voice. Subjects whose voices were normal were, with one exception (a graduate student in psychology), upper-classmen or graduate students in speech.

Apparatus and Experimental Procedures

It was assumed that harmonic analysis of a sound wave provides an adequate description of the physical basis of quality. The theory and procedure of harmonic analysis has been described elsewhere[5,6] and need not be repeated here.

---

[1]Carried out under the direction of Dr. Joseph Tiffin at the State University of Iowa in 1933–1934.

[2]Various synonyms have been used for the term *metallic*, but the judges (especially trained instructors in the speech department at the State University of Iowa) who selected the cases considered the term *metallic* synonymous with the words *strident, rasping, shrill, whining* and *thin.*

[3]Barnes, H. G. A diagnosis of the speech needs and abilities of students in a required course in speech training at the State University of Iowa. *Thesis*, State University of Iowa, Iowa City, Iowa, 1932.

[4]For further information regarding metallic voices see Murray, E., and Tiffin, J. An analysis of some basic aspects of effective speech, *Archives of Speech*, 1, 1933.

[5]Henrici, O. Henrici's harmonic analyzer, *Philosophical Magazine*, 38, 1894.

[6]Lipka, J. *Graphical and Numerical Computation*. Wiley, London, 1918.

TABLE I

AVERAGE PERCENTAGE OF ENERGY IN EACH PARTIAL FOR VOWELS u, o, a, e, AND i, AS PHONATED AT FIVE PITCHES BY TWO SEVERELY METALLIC- AND TWO NORMAL-VOICED WOMEN

		Partials																			
Voice	Vowel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Metallic	u	83	16																		
Normal		67	28	1	1		1		1												
Metallic	o	41	48	7	3																
Normal		13	54	24	7	1															
Metallic	a	50	12	11	13	8	2														
Normal		6	7	14	36	23	7	6													
Metallic	e	69	21	4	2	3															
Normal		21	53	19	1			2	1	2	1	2		1							
Metallic	i	88	9																		
Normal		58	24	1				2	1	2	1		1	1			1	1		1	1

TABLE II

AVERAGE PERCENTAGE OF ENERGY IN EACH PARTIAL FOR VOWELS u, o, a, e, AND i, AS PHONATED AT FIVE PITCHES BY TWO SEVERELY METALLIC- AND TWO NORMAL-VOICED MEN

		Partials																							
Voice	Vowel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Metallic	u	31	38	24	3		2																				
Normal		33	52	9	4	1	1																				
Metallic	o	19	30	17	21	5	3	2	1																		
Normal		36	19	22	15	5	2																				
Metallic	a	13	7	7	16	16	13	10	3	5	2	3	4	5													
Normal		44	10	6	8	10	9	6	3	1																	
Metallic	e	21	25	18	14	1			1	2	3	4		1	1	1	1	1	1	1	1	2	2	3			
Normal		33	28	14	11	6						1	1	1	1												
Metallic	i	36	41	5								1			1	2	1	1					1	1	1	2	1
Normal		50	39	4											1	1											

Each subject sustained five vowels (**u, o, a, e, i**) at five pitches[7] before a condenser microphone in a partially damped room. The sound waves were photographed by means of an oscillograph. One sound wave from each oscillogram was enlarged and analyzed with the Henrici analyzer. The harmonic analyses extended to various numbers of components depending upon the frequency and complexity of the waves.[8] Corrections were made over the frequency range for irregularities of the oscillograph system.

Findings

The average amount of energy in each component for all of the pitches was calculated. Results are presented in Tables I and II. Averages for women's voices are presented in Table I. Metallic voices in this group show a preponderance of energy in the fundamental with relatively weak higher components. In women's normal voices the fundamental is consistently less prominent and there is a greater amount of energy in the lower overtones. If we think of women's metallic voices as thin, these findings bear out the statement of Auerbach[9] that lower overtones up to the sixth, accompanying a fundamental in moderate intensity, make the complex tone sound more sonorous and therefore more musical. Compared with a pure tone, the complex tone has something more rich and impressive. The averages from men's metallic voices (Table II) are an exact antithesis to those for women's metallic voices. In men's metallic voices less energy falls in the first component and there is a much greater spread of energy in the higher components.

A far greater percentage of the energy is located in the lower partials (1 to 6) and there is a far smaller amount of energy in the second frequency region in the **e** (8th to 23rd partial) and **i** (11th to 26th partial) sounds in men's normal voices than in men's metallic voices. The findings are in agreement with Auerbach,[10] and Helmholtz[11] who states that a *cutting* tone is produced "when partial tones higher than the sixth and seventh are very distinct." Data obtained on men's metallic voices corroborate statements by Fletcher[12] and Russell[13] that emphasis of partials above 5000 results in a metallic piercing quality. They reveal further that the vowels **e** and **i** are more metallic than **u, o,** and **a.**

---

[7]The subject voiced the vowels (**u,** as in loom; **o,** obey; **a,** father; **e,** late; **i,** meet) separately at his lowest pitch, then he raised the pitch in five steps to his highest possible pitch.

[8]Analyses extended to as few as ten and to as many as forty components. The analyses extended to the twentieth partial for most waves.

[9]Auerbach, F. *Akustik* (Russell's translation in *Speech and Voice*, second volume in Winklemann's *Handbuch der Physik*, Leipzig, 1909.

[10]Auerbach, F., *ibid.*

[11]Helmholtz, Herman von. *Sensations of Tone* (Ellis translation), Longmans Green, London, 1912.

[12]Fletcher, H. *Speech and Hearing*, Van Nostrand, New York, 1929.

[13]Russell, G. O. *Speech and Voice*, Macmillan, New York, 1931.

Conclusions

Since twenty-five sound waves were analyzed for each subject it was impossible, in the time allowed for this study, to include a greater number of subjects. With this limited number of subjects, it appears that:

1. Women's metallic (possibly, *thin* would be a better term) voices tend to locate a preponderance of energy in the first component with a relatively small amount of energy in higher partials.

2. The fundamental is less prominent and there is a greater amount of energy in the lower overtones in women's normal voices than in women's metallic voices.

3. A smaller amount of energy is located in the first component and there is a greater spread of energy into the higher partials in the men's metallic voices than in the men's normal voices.

4. A far greater percentage of energy is located in the lower partials (1 to 6) and there is a smaller amount of energy in the second frequency region in the **e** and **i** sounds in men's normal voices than in men's metallic voices.

BOOK REVIEW

THE DOCTOR AND THE DIFFICULT CHILD, Part II. By Wm. Moodie. Speech Defects, pp. 173–178. Commonwealth Fund Publications, N. Y. 1940.

The book as a whole informally presents some fundamental causes of behavior and personality difficulties in children, how they may be recognized, investigated and treated. The section of speech defects discusses possible causal factors leading to the onset of the speech defect. The author believes that treatment should *not* be postponed. The genesis of speech, factors such as imitation, psychic and physical causes are discussed in some detail. Speech defects may be used by the child, unconsciously, as a screen for more serious disturbances, as in the case of stuttering. The significance of hyper-emotionality, fear, anxiety and dread as causal factors are discussed. The connection between handedness and speech disturbances are mentioned. The author speaks of some theories of deficient visual and auditory imagery as possible cause for formless, vague, indefinite thinking and consequent muddled speech. Stuttering is discussed in some detail. Voice defects are recognized as fairly frequent, not only normally being present at puberty when the voice changes, but sometimes remaining in the form of roughened voices, uneven and peculiar quality of tone and poor vocal control, even after the changes of puberty have taken place. The child should come through this period with normal, well-placed voice. *S. M. Stinchfield-Hawk*, University College, Univ. of So. Calif.

Submitted Sept. 30, 1941. 1557 N. Gower St., Hollywood, Calif.

THE FUNCTION OF THE SPEECH CLINIC IN THE NATIONAL EMERGENCY

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In discussing "The Function of the Speech Clinic in a National Emergency, we may properly make a division of the topic to place attention on the classes of individuals which will be benefited by the speech clinic during such a period.

As I see it, there are two possible groups who may be aided by Speech Clinics in an emergency:

A.

If the emergency develops to the point where there is active participation by our military forces in war, then we can look for the presence of relatively large groups among the wounded in action which will be characterized by speech defects resulting from brain wounds and from wounds involving parts of the vocal mechanism. Such conditions probably would result in aphonias among those with brain injuries and various types of aphonias, dysphonias, and dyslalias among those whose wounds and subsequent application of plastic surgery have resulted in modification of the peripheral speech mechanism.

Among those involved in military service may be individuals whose personalities may break down due to strenuous military routine or phobias of various types connected with the business of organized warfare. The speech clinicians by virtue of their training in psychopathology and the methods of mental hygiene may be of great service to these cases in personality reorganization and adjustment.

For the adequate discharge of the duties outlined so far, it seems to me that there must needs be recognition by the proper medical and personnel departments of the army and navy of the important contributions that can be made to disabled men by the knowledge and skill of trained speech pathologists. It seems only logical that the need for the services of the speech specialist and the equipment needed for his work should form a part of the rehabilitory preparations made in the program of National defense.

Responsibility for the recognition, classification, neurological treatment and the plastic surgery involved should be placed in a specially prepared unit of the medical corps of the army and navy.

A roster of competently trained Speech specialists should be made up which will give information as to who will be available to give what aid they can in the diagnosis of the cases and the actual

speech rehabilitation work after all possible medical and surgical measures have been taken to give each case as nearly a normal speech mechanism as possible.

B.

The Second group to which the speech clinic can be of service in time of an emergency would be found in the civilian population.

The Speech Clinics are staffed with clinicians who have had training in the techniques of mental hygiene. In times of national emergency there may be an increase of emotional disturbances which may be set off by the departure of loved ones for military service or by fear of such service on the part of young men eligible for induction into the military organizations.

The speech clinics can become first aid stations for personality disorganization difficulties which may arise out of these emotional strains during the emergency. In order to do this, it will become necessary to have the general public made aware of the fact that the Speech Clinic is prepared to give this service whenever it is needed. To aid in this problem of making the public aware that help is available for these emotional disorders in the speech clinics the clinic can organize and carry forward a campaign of prophylaxis aimed at the prevention of these emotional breakdowns among the general citizenry.

Another function in which the Speech Clinic can be of service is that of the detection of the malingerer who adopts some symptomatology involving speech as a means of escaping induction.

There may be some increase in certain types of speech deficiency such as stuttering during a period of national emergency. The Speech Clinics can, of course, be of service to these cases in their regular functioning.

In summary, then, the speech clinics can serve in a national emergency by being prepared to aid in the rehabilitation of speech deficiency due to organic and functional disablement on the battlefield and in carrying a program of prophylaxis and treatment to those among the civilian population who experience speech difficulties.

The June, 1941, issue of the *Review of Educational Research* was devoted to "Education of Exceptional Children and Minority Groups," and contains much material of interest to the readers of the *Journal of Speech Disorders*.

Single copies of the *Review* sell for $1.00. Any person ordering a number of copies of the same issue as a teacher might do for use of a class, can secure a discount—10% on orders of 2 to 9 copies, 25% on orders of 10 to 99 copies, 33⅓% on orders of 100 or more copies. Orders should be placed directly with the American Educational Research Association, 1201 Sixteenth Street, N. W., Washington, D. C.—G. O. R.

COORDINATING PROFESSIONAL RESPONSIBILITIES IN SPEECH CORRECTION AND SPEECH EDUCATION

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Regardless of how completely we may believe in democracy, it is clear that, in the year of our Lord 1940, democracy is in grave danger of being eliminated from the world. If democracy is to continue to exist, it must admit that in the past it has often been relatively inefficient, and it must promptly become much more efficient. This means that, if democracy is to survive, even in America, it must immediately improve itself in such ways as will enable it to accomplish more effectively the purposes for which it was established.

In a pioneer society it was important for each citizen to have a great variety of skills, and to be able to do practically everything for himself. Modern American democracy, however, cannot permit everyone to do everything. If we are to have real efficiency in modern life, each individual must make those particular contributions to the common welfare for which he is well qualified by nature and by experience. Each individual citizen must understand his own capacities and limitations as these are related to the needs of modern society, and then he must strive to make the maximum possible contributions in those fields in which he can secure real satisfaction for himself through his efforts to carry forward appropriate work that is essential to the success of the total community.

In order to facilitate this provision that each individual should choose to work in a field in which he can make maximum contributions, modern American democracy must attempt to make each citizen feel definitely responsible for developing maximum efficiency in the entire community and state. It is no longer possible for us to assume that everyone is by nature so enthusiastic for our form of government that he will exert himself vigorously to maintain and to improve it. We are now in the midst of a mighty world conflict of ideas with regard to government and social organization, and this emergency makes it absolutely necessary that the advantages of democratic organization be presented so forcefully and so clearly that every citizen will choose to assume a personal responsibility and enthusiasm for seeing to it that democratic society in America becomes as efficient as possible. Anyone who wishes to call this "indoctrination" may do so. I believe thoroughly, however, that the American people, if the facts are made known to them, will choose to develop real efficiency in our democracy, rather than to permit

inefficiency to continue and democratic institutions to disappear from the earth.

Efficiency in democratic organization will require that every citizen be trained to face problems squarely, to look for, to examine, and to evaluate evidence with regard to those problems, and then to be thoroughly willing and able to express his judgments with regard to the significance of the evidences that have been revealed. This does not mean that every individual must become an expert in every field of knowledge, but it does mean that every individual must understand how experts arrive at their judgments, how to identify the experts who are most likely to be thinking clearly and in terms of the public welfare, and how to lead these experts to reveal the evidences on which their judgments are based. Unless democracy can bring about an efficient social order (1) in which each individual is contributing effectively in those fields which are appropriate to his own abilities, (2) in which each individual feels definitely responsible for the total efficiency of the state, and (3) in which each individual is willing and able to participate in the discussion of policies and the evaluation of evidences presented by experts, democracy may not be able to endure much longer in a world that is largely dominated by dictators.

Any system of education which fails to develop in its students these essential characteristics required of citizens in an efficient democracy has no place in America today. We may talk all we wish about such vague educational purposes as "handing down to future generations the great lessons learned in the past," or "developing all of the capacities inherent in each individual student," but unless each American boy and girl develops these qualities needed by citizens of an effective modern democracy, including the will and the ability to express his own judgments with regard to the social desirability of any proposal for common action, the training provided will not have been appropriate for Americans in these middle decades of the Twentieth Century. The war now in progress in Europe is a war over basic ideas and social ideals, and it is being fought by psychological weapons quite as much as by powder and shells. Our schools must be recognized as first-line trenches in the protection of American democracy. Each inarticulate citizen is a weak spot in our defense against un-American propaganda and in our development of efficient democratic procedures.

The most generally used tool of social communication and of self-expression is speech. It matters little how keen an individual's ability to analyze problems and to discover satisfactory solutions may be, unless he is able to express his judgments in terms which can be understood by his fellows, the effectiveness of social action in his community is not likely to be affected or improved by his living there. With the development of modern amplifying systems, talking pictures, and the radio, speech has become a much more important tool of social communication than ever before. Even the great political parties are beginning to give serious consideration

to the radio voices of prospective candidates for office, considering them almost as important as the ideas and ideals for which the candidates stand. An individual's speech habits can no longer be considered a matter of his own exclusive concern. In our American democracy it is a matter of vital importance to every citizen that each other citizen be able and willing to make clear to all of us his experiences and judgments regarding public policies.

The individual who does not have efficient control of his speech organs may easily develop a morbid sense of social inadequacy. Other forms of self-expression are, in general, much less essential to a well rounded personal life. One who cannot play golf skillfully is not usually inclined for that reason to withdraw entirely from human society. One may not be able to sing beautifully, or to play a musical instrument skillfully; he may not be able to paint, to dance, or to write poetry; and yet he may still hold his head high and be listened to eagerly by his fellows. One who is unable to speak with reasonable fluency and clarity, however, is often cut off from many of the normal social contacts needed by human beings. All too frequently the word "dumb" is applied to him, and few people take the trouble to discover whether this refers to a physical or to a mental infirmity. Without effective speech, an individual is severely handicapped in securing the normal satisfactions of social and economic life.

The confident, fluent, public speaker tends to gain recognition as an intelligent and interesting person, even though he may have little more than average knowledge and ability. A charlatan with assurance and a good speaking voice is very likely to gain a following, especially among those who are themselves not able to speak fluently and who have not, therefore, learned how to discount the devices used by public speakers to influence their audiences. The trained scientific expert, who has great skill, intelligence, and knowledge, but who is too timid or inarticulate to get up and tell what he knows and believes, is likely to be overlooked by the majority of the community.

I recall a number of instances, during the years I was teaching at Columbia University, in which we invited so-called "character analysts" to demonstrate before the classes in psychology. In each case the statements made by these psychological quacks showed clearly the absurdity of their claims. In spite of the ridiculous nature of the statements made, however, each demonstration was followed promptly by visits on the part of numerous members of the class to the offices of the faker who had been exposed. Large fees were paid by many of these students to have their own characters "read." These students were typical of a large percentage of the human race, in that they responded to a confident, fluent speaker more fully than to an intelligent, but less-articulate scientist.

American education can no longer neglect the development of systematic instruction in the field of speech. Technological developments have multiplied the importance of speech as a tool of self-

expression and of communication, and yet the schools have been slow to recognize this change. The necessity for greater attention to speech in the schools is quite as much a matter of training consumers of speech as it is of training producers of speech. Young people must all learn more about the methods by which speakers attain desired results, in order that they may know how to defend themselves against the undesirable effects of speech, quite as much as in order to be able to use these devices for desirable ends.

It should not be difficult to persuade children in school that speech is an important part of their education. Practically all of the activities of the average school depend heavily upon conversations and oral instructions. Teachers obtain their estimates of pupils' abilities and progress in practically every field through asking them questions and hearing their spoken answers. Nine-tenths of all the classroom activities in most schools consist in discussions,—questions and answers given orally. It is through speech activities primarily that each pupil becomes adjusted to his fellow pupils and to the routines of the playground, laboratory, and gymnasium. One pupil becomes a leader and another pupil becomes a follower in any particular activity chiefly through their relative effectiveness in the use of oral language. All pupils need effective control of speech as a tool for making desired adjustments and progress in school, and it is not likely that it would be hard to convince most pupils of the advantages of effectiveness in speech.

Speech education appears to be essential to the preservation and improvement of American democracy, is clearly necessary as a part of the preparation of each individual for obtaining the social recognition and personal satisfactions normally desired by human beings, and can easily be recognized by boys and girls as having real importance in their immediate school and home activities. Why, then, does it develop so slowly?

I confess that I do not know the full answer. I suggest, however, that it might be worth while for us to emphasize the importance of having *every pupil learn to speak effectively* and of subordinating somewhat the technical diagnosis and treatment of speech disorders to this larger and more challenging educational purpose. As soon as all teachers and school officers are vitally concerned and reasonably well-informed about the development of effective speech habits in every pupil, fewer speech disorders will be developed in pupils as a result of poor instructional techniques. I am confident, at least, that speech is not likely to serve the patriotic, social, and personal ends it should serve, until it is recognized by every educational worker as an essential part of the training needed by every child in America. Every teacher must become a teacher of effective speech.

If this condition is to be brought about, certain changes must take place in our present teacher education programs. The chief function of the Speech Clinic at The Pennsylvania State College, for example, is to train experts in the diagnosis and treatment of speech disorders. The School of Education is trying to speed the

day when every teacher, supervisor, or administrative officer who comes to State College for professional study will become reasonably well acquainted with the specialized work done in the Speech Clinic, the Reading Clinic, and the Psycho-Educational Clinic. We do not intend for every teacher to become an expert in detecting and correcting speech defects, but we do want every teacher to be able to recognize most of the common disorders, in order to be able to refer them to someone who is an expert in speech. We hope that each teacher and principal will learn enough about speech education to be able to avoid aggravating any tendencies toward speech disorders that may exist in the pupils, and perhaps to be able to help all pupils to say more effectively the things they need and wish to say at school. We are hopeful that those who have studied in the School of Education here will have learned enough to be able, with the suggestions provided by their local expert in speech correction, to carry out reasonably well the program of special instruction in speech needed by most of the pupils, and to co-operate intelligently in all cases.

The same type of relationship is desired between the regular classroom teachers and the specialist in reading. We do not expect all teachers to become experts in the diagnosis and correction of reading disorders. We do hope, however, that through close contact here with our Reading Clinic, all teachers will be able to be helpful to most pupils in reading, that all will be able to detect and refer to experts those who need expert diagnosis and treatment, and that all will be able to co-operate effectively with the specialists in treating individual cases.

In my judgment this will mean a far greater demand than we have ever had in the past for specially trained experts in the diagnosis and treatment of individual cases, as well as a greatly increased appreciation and respect for their expertness and specialized skill. The need for speech education is so universal and so important that everyone concerned with our schools must take a part in providing it, but the greater number of persons participating in it will increase the relative importance of the trained psychologist who has developed special competence in speech diagnosis and treatment. All educational practitioners must, I think, become better acquainted with speech problems and more competent to participate effectively in speech education. But such an increase in concern, understanding, and competence among teachers in general will certainly be followed by a corresponding increase in the professional regard and demand for trained experts with highly specialized qualifications in this field.

We are all responsible for speech correction and speech education; but each of us should give his energies to those particular activities in which he can make the greatest contributions to the total result: more effective speech for every citizen of America.

BOOK REVIEW

FROESCHELS, E., AND JELLINEK, A., Practice of Voice and Speech Therapy. Expression Co., Boston, 1941. 255 pp.

This volume describes methods and interprets findings of various authors in European Speech Clinics, stressing particularly those of the authors themselves in their experience in Austria. Beginning with general problems of the speech-defective, they discuss the importance of surrounding personalities, and the fact that it is sometimes wisest to separate the child from the home situation, during speech training, even over a period of months. Case history taking is treated briefly. The authors' emphasis upon imagery types and methods of testing are outlined. Some attention is directed to the application of phonetics to speech correction, and diagrams showing the position of the various speech organs during the emission of several vowel and consonant sounds are given. The chapter of diagnosis and treatment of aphasia and amusia is a useful portion of the book, suggesting many helpful methods for the re-education of the aphasic patient. There are few available volumes on this subject which present such a wealth of suggestions for training in aphasic cases. Organic speech disorders are discussed, under the head of Dysarthria. Remedial reading receives some attention from the authors. Therapy for the hard-of-hearing child and so-called deaf-mute indicate new types of acoustic training; visual education through lip-reading and kinaesthesis, are emphasized. Useful methods for the speech education of the spastic child are presented. Various types of stuttering and cluttering are reviewed from the European standpoint. Voice disorders, organic and functional, are discussed in some detail. Ten cases of voice disorders are outlined as to symptoms, findings and treatment. The application of breathing exercises to vocal functions is discussed, with exercises to illustrate. The volume concludes with a chapter on the origin of human speech,—which should perhaps have been presented at the beginning,—and the authors succeed in presenting in compact form much of their experience in European speech clinics over a period of many years. To students unfamiliar with speech correction methods abroad, this book is one of the most useful which has been printed in English for some time, for the speech pathologist. To those already familiar with the work abroad, it offers a clear, concise presentation of various theories, clinical findings and therapies in use abroad, in the field of speech disorders. With the coming of numerous speech specialists to this country, such methods are bound to come more frequently into current use in America.

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NEED AND CARE

GUSTAV TUGENDREICH, M.D.,
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Measuring the need for medical care is based on the findings of statistical data, predominantly of morbidity and mortality. The interpretation of the statistical figures and data is not an easy task. Particularly, morbidity statistics is called the step-child of statistics. Morbidity statistics is the result of the diagnosis made by the physician; diagnosis is dependent on the capacity of the individual physician. The standardized medical training guarantees a somewhat equal level of the diagnostic skill.

But there are some ailments which leave it up to the discretion of the individual physician whether he should consider his findings normal or pathological and whether he should prescribe some treatment or not. In such cases diagnosis would be easily influenced by the fact whether there are facilities for treating the ailment in question or not. So we have a relationship between the extent of facilities for treatment and the frequency with which certain defects are diagnosed. This surprising fact, which of course, influences the morbidity statistics, is not sufficiently—at least so it seems to me—taken into consideration in measuring and evaluating the need for medical care.

The Seminar of the Social Economy Department of Bryn Mawr College has just finished a very detailed research on Child Welfare in Montgomery County, Pa., surveying all the medical and social services offered to the child by public and voluntary agencies.

Among the items we have been interested in is the item: *Speech-defective children.* The State Department of Health of Pennsylvania was kind enough to provide us with the following data:

The State of Pennsylvania is divided into four classes of school districts, according to the population.

First class school districts with a population of 500,000 or more.

Second class school districts with a population of 30,000 to 500,000.

Third class school districts with a population of 5,000 to 30,000.

Fourth class school districts with a population up to 5,000.

In Montgomery County, Pa., there are: 2 school districts of the second class; 8 school districts of the third class; 53 school districts of the fourth class.

The figures and data we owe to the kindness of the Health Department, are concerned with the eight school districts of the third class.

TABLE I

SPEECH-DEFECTIVE CHILDREN (SCHOOL YEAR 1936–37)* IN THE EIGHT SCHOOL DISTRICTS OF THE THIRD CLASS IN MONTGOMERY COUNTY

Township or Boro	School Children Enrolled, 1936–37	Number of Speech Defective Children	Per 1,000 Enrolled	Number of Speech Defectives Treated
Abington township	4,206	178	42%	100%
Cheltenham township	3,020	206	65%	100%
	7,235	384	51%	
Bridgeport boro	1,218	6		
Conshohocken boro	1,939	1		
Lansdale boro	1,896	3		
Upper Merion township	1,319			
Pottstown boro	4,070	17		10 treated
Springfield township	961	11		1 treated
	11,403	38	3%	
*In 1939 the figures are:				
Abington	4,016	151	38%	100%
Cheltenham	3,157	152	47%	100%
Conshohocken	1,841			
Lansdale	1,718			
Upper Merion	1,139	4		
Pottstown	3,739	13		
Springfield	948	5		

The discrepancy between Abington and Cheltenham, and on the other hand, the six remaining townships, is striking. Abington and Cheltenham together report 384 speech defective children among 7,235 pupils, while the six other districts together reported only 38 cases of 11,403 pupils.

The number of speech defective children per thousand of the enrolled total was: Abington and Cheltenham, 51; the six other districts, 3. The explanation of the large discrepancy is to be found in the fact that both townships, Abington and Cheltenham, have special classes for speech-defective children, and the other six districts fail to have facilities for speech-defective children.

We are fully aware of the fact that the term "speech defect" is not defined well, and that one physician may diagnose speech defect when the other would decline to do so. But the discrepancy between 51 and 3 is much too large for this explanation to be satisfactory.

Moreover, there are statistics proving that the percentage of speech-defective children in Abington and Cheltenham is in accordance with the findings in other reports, f. i.

	Speech-Defective Pupils per 1,000 School Pop.
Philadelphia[1]	34
Buffalo[2]	40

The conclusion seems to be evident that there is a relationship between the medical services in existence and the stated need. If a community is lacking in certain health services, the need for it is not likely to be stated.

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[1]Report of the Superintendent of Public Instruction for the year ending July, 1936, p. 19.

[2]Report of the Buffalo School Survey, 1930, Part I, pp. 111–114. According to Earl W. Wells, The Speech-Defective Pupils in the Ranks of the Handicapped (Nat. Educ. Ass'n. Addresses—V. 74, p. 394 (1936), 5–15% of the enrollment are speech-defective. One million speech-defective children in the U. S. (White House Confer., 1930, Subcommittee on the Speech-Defective Child).

BOOK REVIEW

A PRIMER ON THE PREVENTION OF DEFORMITY IN CHILDHOOD. Richard B. Raney, M. D. Published by The National Society for Crippled Children, Elyria, Ohio. October, 1941. 188 pp., Glossary and Index. 88 illustrations. $1.

Here is a little book which many a Speech Pathologist will welcome, especially the one dealing with spastic cases, and with other crippled whose speech is bad. The opinion of orthopedic specialists is well shown in the following observations:

J. Archer O'Reilly, M. D., Professor of Orthopedic Surgery, St. Louis University, St. Louis, Missouri:

"The Primer on the Prevention of Deformity in Childhood will prove a most valuable addition to our literature on this subject.

"It is not a textbook on orthopedic surgery, but it is a book that will be useful to the orthopedic surgeon for reference; it should prove invaluable in the hands of general practititioners, who can turn to it for advice when they are confronted with some crippling condition.

"It should be in the hands of nurses, social workers, teachers, and all who have to deal with crippled children, because it will help them understand the crippling conditions and what to do for them, and if

used, should prevent many deformities. I can very strongly recommend this Primer to all who are interested in the welfare and the physical betterment of the crippled child."

Edward L. Compere, M. D., Orthopedic Surgeon, Chicago, Illinois. (Former Professor of Orthopedic Surgery, University of Chicago):

"There has long been a need for a book dealing with the problem of crippling which the lay worker in the field of the physically handicapped could read and understand. This volume by Doctor Raney really meets that requirement.

"Most textbooks and reference volumes available on the subject of diseases and deformities which produce crippled children have been written by physicians for medical students or medical colleagues. These books have been prepared on the theory that those who used them would have wide knowledge of medical terms, and of physiology and pathology of the bones and joints.

"Medical social service workers, teachers of crippled children, parents of crippled children, members of boards of hospitals for crippled children, non-medical hospital superintendents, members of county, state, or national societies for the crippled, and even the vast majority of physicians in general practice of medicine will welcome this book by Doctor Raney because they can read it and understand what he is talking about. The numerous illustrations portray graphically in artists' drawings each crippling condition. These are more effective than photographs, and infinitely more illuminating for the lay reader than would be x-ray prints.

"As an orthopedic surgeon, I am very much pleased to recommend to the great army of professional and lay co-workers in the fight against crippling, this Primer on the Prevention of Deformity in Childhood."

Every speech pathologist knows the varying effects of any crippling condition on the personality. And he realizes too the close relationship of many speech handicaps and certain physical impairments. Anything he can do, therefore, to disseminate what knowledge there is which might lead to the prevention of deformities arising in childhood becomes his duty.

G. OSCAR RUSSELL

THE VIBRATO: A SPECIFIC INTEGRATIONAL EMERGENCE UPON FUSURE OF SOMATIC RHYTHMS[1]

KENNETH N. WESTERMAN

There have been, since the turn of the century, many investigations in vibrato,[2] that rhythmic pulsation heard in the human voice, particularly when produced by trained singers. These investigations were confined almost entirely to its perception and the physical aspects of the rate, amplitude, and complexity of its wave forms.

Believing that the human voice, to the producer, has its causation, transmission, and perception in physiological functions, the present investigation was made from the standpoint of the physiological actions which produce vibrato. The contribution of the present investigation, if any, lies in the search for:

1. The somatic rhythms which are fused in the emergent vibrato.
2. The muscular actions in the voice-producing mechanism which assist in that fusure.

This study of the specific integrational emergence of vibrato in the human voice was made through an objective examination of the effects upon the voice of physiological actions in the framework of tonus, tetany, contracture and simple contraction.

It was already known through previous investigations that vibrato consisted of more or less regular pulsations of three separate cycles: rate, amplitude, and complexity. In perception, these three cycles are recognizable as pulsing variations in pitch, intensity, and timbre.

It was self-evident that three things would be of vast importance to a causative investigation:

1. A thorough knowledge of the tonic innervation of gross skeletal muscles, in order to know the source of the rates found.
2. A thorough knowledge of the framework of tonus, tetany, contracture and simple contraction in order to determine certain basic techniques for experimentation.
3. Adequate machinery for permanently recording the vibrations in the voices of subjects, so that the results of physiological actions could be studied at leisure.

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[1]An epitome of a dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Science in the University of Michigan, June 27, 1938. Dr. John H. Muyskens, Chairman, Committee.

[2]See bibliography at end of article.

An exhaustive investigation, covering all available sources of research in the action currents innervating the muscles of the human body, brought the following facts to light.[3]

1. **The source of tonus is from the muscle itself.** This is constantly proven by its complete loss, on section of either its receptor (afferent) nerve or its effector (motor, efferent) nerve.

2. **Tonus is the controlling mechanism for the fixation of gross skeletal musculatures.** This is shown by the fact that its action current rates of 5, 7, and 10 per second are found as a background in muscles showing active contraction rates of 20, 40, 50, and 100 per second.

3. **Physiological tremor and tonus are identical and form the normal background of all postural muscular activity.**

4. **Clinical tremor and hypertonicity are exaggerations of this mechanism;** caused by physiological conditions destroying its normal emergence.

5. **Action currents are of vibrato rates in physiological tremor, tonic contractions, and in tetany of gross skeletal muscles in a condition of balanced flexibility.**

6. **Reflex tonicity, expressing itself in the somatic rhythms shown in the action currents of muscles in postural activity, is in reality, a fusure of receptor nerve impulses through the co-ordinating functioning of cerebellar, vestibular, lenticular, cortical, and rubro-spinal nerve paths, for the efficient maintenance of active posture.**

The contributions of physiology to our problem are of inestimable worth, for they bring to us, not only the facts of somatic rhythms at vibrato rates, but the framework of the muscular actions which carry those rhythms in both normal and clinical forms. *They showed that when the tetanic contraction of gross skeletal muscles of posture, as fixating muscles of primitive levers, according to the scale of tonus, tetany, contracture, and simple contraction, functioning phasically with the smaller adjunct contracture groups of respiration, permit the simple contractions of the selective action of the minimal motors of phonation and articulation, a normal vibrato should emerge.*

The techniques used and the data examined resulted from the above working hypothesis.

For recording the voices of subjects, a velocity type radio microphone, standard commercial amplifiers, and recording cutter were used. The motor driving the recording turntable was a synchronous motor, which maintained a constant turntable speed at all times. The same was used as a play-back when pictures were made. The amplifiers were capable of faithful reproduction over a frequency range of 40 to 10,000 cycles per second and the recorder from 40 to 6,000 cycles per second. This range was sufficient for any tone complexity in overtones of any value in examination.

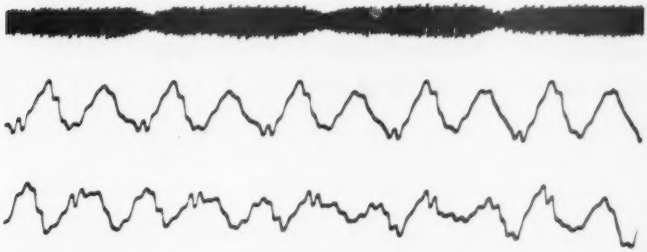
In the matter of machinery for examining the records of voices, of

[3]See bibliography for main sources of information.

the subjects used in the investigations, an enormous amount of experimentation was carried on.

Because of the chance of mechanical losses in transmission, the phoneloscope and phonodyke types were finally discarded as not being sensitive enough for perfect recordings. Experimentations with the cathode-ray oscillograph finally resulted in the construction, by Jerome Weisner of the Electrical Engineering School, of a special oscillograph, designed for this investigation, with a controlled anode potential from 1200 to about 3000 volts. This made possible a brilliancy in light which made the photographing of the records both distinct and accurate.

A high-speed camera from the University Heart Station was used for making the pictures. Since the original research, a new high-speed camera has been built for the investigator by the University Physics Instrument Shop, with special gear shift and synchronous motor, so that either the slow forms of action currents or the minute details of fundamental and overtones may be studied in the wave form. The three accompanying pictures show a typical vibrato wave form of a trained soloist and the same wave form at the antinode and node of a single form at the higher speed, and larger amplification. The first shows the vibrato; the second and third shows fundamental and overtones, at the antinode and node positions of a single vibrato wave form. The vowel is an ē.



To disassociate vibrato emergence from psychological aspects and the already disproven "emotional tension" working hypothesis, of the early Iowa researches, the investigator made some preliminary examinations under physiological conditions which could not possibly be construed as emotional. The vibratos of trained singers were examined from simple m, n, and ng hums before and after violent exercise. (Twenty-two subjects were used. Adult students and teachers of voice attending the University Summer School, students at the University School of Music, and voice students of the investigator.) The results were overwhelming. Vibrato regularity and control were exactly in proportion to each students' ability as an athlete to control the balanced flexible use of his muscles. Track men, basketball players, swimmers, tennis players, football players, all showed practically the same tonic controls before and after

exercise. Overweight, sedentary, flabby individuals, with good vibratos before exercise, completely lost control after exercise, their vibratos taking on active contraction rates, instead of those of tonic innervation.

Considerable thought was given to the techniques to be used in the examination of the physiological emergent framework of tonus, tetany, contracture, and simple contraction as expressed in posture, respiration, phonation, and articulation.

It was decided that a good cross section of voices could be found by examining groups of subjects from the 5th Grade, Junior High School, Senior High School, and the University. Special singing ability was not required, the only requirement being that the subjects sent should be in the upper half of their respective groups as to intelligence.

Three simple techniques were used:

1. The group was sent by the microphone, one at a time, with instructions to hum into the microphone with an *m* hum. The pitch of C or F was used, according to the ease of its production for each individual.

2. A second recording was made after the following instruction was given—"Just lift your chest enough to free up the use of the muscles around your ribs and the wall of your stomach."

3. A third recording was made after some practice, humming, using the first half of the colloquial yes "mhm" to acquire a clear tone from normal spoken controls.

The m hum was used for all subjects and all techniques because of its lack of any muscular tension in articulation or vowel form, to interfere with the simple wave form of the pitch used by each individual.

Three reports were taken into consideration with each subject. The report which the student gave of his own experience as a vocalist; the perception notes which the investigator made during the recording of each subject; and the objective findings of the developed film through careful examination with calipers and transparent millimeter rule. These three reports were made as separate projects and no co-ordination done until they were all completed. For further verification, the records were played and compared with the developed film. This was done by two trained musicians with no reference to the other three reports. Thus the reports as finally given, are the objective reports of scientific measurement, doubly verified through the two-way subjective reports of perception. The perception reports were practically identical with the scientific measurements. Where there was the slightest variation, the objective measurement was used.

The following report for a group of 54 subjects examined, shows the effects of the simple techniques of posture and clear tone upon the emerging vibrato.

Before giving the techniques of posture and clear tone:

6 showed regular vibrato
33 irregular vibrato
15 with no vibrato or questioned

54 subjects

After following the instructions in posture and clear tone:

46 showed regular vibrato
6 irregular vibrato
2 questioned vibrato

54 subjects

We note that 24 subjects developed ***amplitude*** vibrato by the use of the ***posture*** technique only, and that 20 subjects developed ***pitch*** vibrato by the use of the ***clear tone*** technique; although 7 developed ***pitch*** vibrato by the use of the ***posture*** technique. Subjects Nos. 40, 43, 45, and 48 (all with pitch vibrato before any instructions were given), lost their pitch vibrato with the emergence of amplitude vibrato on the ***posture*** technique, but regained the pitch vibrato on the ***clear tone*** technique.

That the above are very definite indices that ***amplitude vibrato*** emerges from respiratory controls and the ***pitch vibrato*** from the mechanism of laryngeal pitch, when used in the production of clear tones, is not to be overlooked.

A report of the effect of posture and clear tone techniques upon the group of 16 Junior High students is even more significant.

Before instructions were given:

4 were with no vibrato.
12 with irregular vibrato.

By following the instructions in posture and clear tone production:

15 of the 16 developed regular vibrato of some type.
10 developed ***amplitude*** vibrato by use of the ***posture*** technique.
1 developed ***pitch*** vibrato by use of the ***posture*** technique.
12 developed ***pitch*** vibrato by use of the ***clear tone*** technique.

The emergence of the amplitude vibrato from the posture technique, which gave freedom to the balanced flexible use of the musculatures of the respiratory mechanism, and the emergence of pitch vibrato from the clear tone technique, when "the vocal lips are approximated under mutual pressure laterally by the tonus of, and by the bulk of the thyro-arytenoid muscle aided by the structures lateral to it"[4] are both indices that the laws of structure and function are at work in vibrato emergence, and that the surges of energy through the pulses of tonus, tremor, and tetany of regulated respiration are responsible for amplitude vibrato, while the balanced flex-

[4]Bibliography, Strong.

ibility of the intrinsic musculatures of phonation, with their regulating action currents are reflected in the pitch vibrato.

It is reasonable to expect that future investigations may show that complexity vibrato emerges from the effect upon the tone wave of musculatures controlling resonation and articulation. Empirical findings of the writer during his 25 years' experience as a voice teacher have shown many cases of pulsations of uvula, soft palate, pharyngeal muscles, cheeks, tongue and lips. Any of these would reflect in the complexity of the tone wave through pulsing changes in the structure of the human resonator.

From the indices of the present investigation and the laws of adequacy in structure and function, the following findings are tentatively given with a full realization that future research on many subjects may verify the above thesis.

1. When the fixation muscles of back, neck, and shoulder girdle, with the adjunct musculatures of the thoracic cage, allow the selective action of the muscles of the diaphragm and abdomen to function with a balanced flexibility in respiration, a normal, artistic *amplitude* vibrato will emerge.

2. When the fixation muscles of the human larynx, with the adjunct muscles of its cartilaginous framework, allow the minimal motors of the intrinsic muscles of phonation to function with a balanced flexibility against the power mechanism of respiration, a normal, artistic *pitch* vibrato will emerge.

3. When the fixation muscles of the head and jaw, with the adjunct musculatures of pharynx, nasopharynx, and fauces allow the minimal motors of lips, tongue, and soft palate to function with a balanced flexibility in full resonation of the tone produced, a normal, artistic *complexity* vibrato will emerge.

4. When the gross skeletal muscles of posture and breath control, beautifully balanced in condition of tonus and tetany, are *phasically* functioning against the minimal motors of the delicately varying small muscles of larynx, pharynx, jaw, palate, tongue, and lips, an artistic vibrato emerges.

The above findings constitute the fundamental framework of the teaching of voice through an exact knowledge of the muscle movements involved in its emergence. These surges of energy from the musculatures of posture, respiration, valving, swallowing, sucking and chewing, as they apply to breath control, phonation, resonation, and articulation in the emergence of the human voice, constitute the motor psychology on which the patterning and conditioning of the student as a producer absolutely depends.

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ANNOTATED BIBLIOGRAPHY ON CORRECTION OF SPEECH DEFECTS, 1936–1939

Compiled by EILEEN JOHNSTON

[*Continued from September Issue*]

Buckley, H. M. *How Speech Training is Conducted in the Cleveland Public Schools.* Quarterly Journal of Speech, (April, 1939), 25, 200–4.

Emphasizes (1) need for work on improvement of speech in kindergarden and first grade (2) and a trend toward group work (instead of isolation) as establishing a more natural and genuine learning situation.

An outline of the types of methods which have proved effective is included.

Davidson, Louise D. *Methods for Treatment of Disorders of Speech Due to Birth Injury.* Quarterly Journal of Speech, (Oct., 1936), 22, 404–12.

This paper deals with a treatment for children suffering from speech disorders due to birth injuries—those with minds that are highly intelligent yet incapable of expressing themselves because of motor disfunction and defective speech or no speech at all. Miss Davidson's treatment for such cases consists of working for motor control and speech response through physical therapy, beginning with passive physical training. She gives a number of case histories.

Garbett, W. L., and Campbell, G. *Speech Training for Children.* Educational Method, (Dec., 1935), 15, 150–3.

A student teacher's story of experimental work she carried on in the training schools of a South Dakota normal school. She tells of five cases with which she worked, and tells what she did in each case. She believes that understanding co-operation of parents is vital.

VEGETATIVE RHYTHM DETERMINATIVE OF SPEECH PATTERNS[1]

HERBERT CLAY WELLER

Introduction

The question of what forces set the patterns of rhythm for speech has been an interesting one for investigation. Oliver Wendell Holmes[2] once stated that in speech we get in step with respiration and pulse-beat, the "true timekeepers of the body." Anders[3] discovered that individual rhythm in gait is related to cardiac and respiratory rhythm, the ratio of pulse to gait being 1 : 1, especially in children—thus suggesting that all neuromuscular activity in connection with movement on foot has a rhythmical relationship to the neuromuscular activities in breathing and in heartbeat. Linden[4] reported that in the embryos and larvae of Rana fusca, Alytes obstetricians, Pelobates fuscus and Salamandra maculasa (species of frogs, toads and salamanders) there is always one respiratory movement to each heart-beat. Another significant finding of Linden is that the oscillations of the gills, movements of the floor of the mouth, and the opening and closing of the mouth, coincide with phases of the cardiac cycle. Remembering that he discovered a 1 to 1 ratio between cardiac and respiratory rhythms, we have as a corollary that the oscillations of gills, movements of the floor of the mouth, and the opening and closing of the mouth, also coincide with phases of the respiratory rhythm. By analogy it appears likely that in the corresponding stages of the development of the human embryo, the branchial region rhythms may coincide with phases of the cardiac and respiratory rhythms. Inasmuch as the tongue, jaws, larynx and some other parts of the body used in speech are developments of the branchial region, we might expect the rhythms of speech to be correlated with phases

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[1]This paper is an abstract of an extended Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Science in the University of Michigan, June 1940. Doctor John H. Muyskens directed the research and was chairman of the doctoral committee. Other members of the committee were Doctors Clarence L. Meader, Leon H. Strong, Louis M. Eich, H. Harlan Bloomer and Hide H. Shohara.

[2]Holmes, Oliver Wendell. The Physiological Basis of Versification, in Pages from an Old Volume of Life. Houghton Mifflin Company, New York. (Riverside ed., 1883.)

[3]Anders, Paul. Uber den individuellen Eigenrhythmus beim menschlichen Gange und seine Beziehungen zum Rhythmus der Herz und Atemtatigkeit. Pfluger's Arch. Ges. Physiol. 220 (1–6): 1928. Biol. Abs. 5 (8–9): 20043.

[4]Linden, P. van der. Le synchronisme cardiaque—respiratoire chez les larves d'amphibibiens. Acad. Roy. Belgique Bull. Cl. Sci. 16 (11): 1930. Biol. Abs. 8 (2): 3440.

of the cardiac and respiratory rhythms; and in persons whose speech is relatively free from rhythm disturbances we might expect to find cardiac and respiratory rhythms relatively free from disturbances, and vice versa. In this connection Palmer[5–6] clearly demonstrates the influence of the cardiac cycle over the selective processes in speech. Several others, among them Berry[7], Fossler[8], Murray[9], Peters[10], Robbins[11], Russell[12], Travis[13], and others, have noted that the existence of respiratory disturbances is or has been a common characteristic of stutterers.

If it be true, as now appears, that a causal relationship exists between the rhythm of breathing and the rhythm of speech, and that the rhythm of breathing is more basic than the rhythm of speech, it is reasonable to inquire if one of the methods for improving the rhythm of speech may not be to improve the rhythm of breathing. Necessarily involved in such an inquiry is the even more basic question of whether or not the rhythm of breathing can be changed. This report, based upon an investigation begun in 1932, answers these questions.

Subjects, Apparatus, Procedure

The subjects used in this study were more than 100 stutterers, of both sexes, ranging in age from about 10 to 30 years, who appeared at the laboratory voluntarily for treatment. Some appeared only once or twice or a very few times, while others came repeatedly over a period ranging from a few days to several months.

Kymograph records, each about 10 minutes in duration, were made of both the thoracic and abdominal breathing of both the subject and control. The speed of the apparatus was such that the smoked paper passed beneath the styli at the rate of approximately one foot per minute, slow enough for the general nature of the curves

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[5]Palmer, Martin F. The cardiac cycle as a physiological determinant of energy distributions in speech. Doctoral dissertation, University of Michigan.

[6]Palmer, Martin F. and Gillett, Anna Mae. Respiratory cardiac arrhythmia in stuttering. Jour. Sp. Disord. 4 (2): 1939. (Abs.—Quart. Jour. Sp. 26 (1): 1940.)

[7]Berry, Mildred Freburg. A study of the medical history of stuttering children. Speech Monographs, V, 1938.

[8]Fossler, H. R. Disturbances in breathing during stuttering. Psychol. Rev. Monograph Supplements 40, 1930.

[9]Murray, Elwood. Dysintegration of breathing and eye-movement in stutterers during silent reading and reasoning. Psychol. Mon. (Iowa Studies in Psychol.) 43 (1): 1932. (Abs.—Quart. Jour. Sp. 19 (1): 1933.)

[10]Peters, Clarence A. Public speaking: a therapeutic procedure. Quart. Jour. Sp. 19 (1): 1933.

[11]Robbins, Samuel D. Breath control in stammering. Proc. Amer. Sp. Cor. Assn., 1930–31.

[12]Russell, G. Oscar. A symposium on stuttering. (Quoted by West.) Quar. Jour. Sp. 17 (3): 1931.

[13]Travis, Lee Edward. Studies in stuttering. I. Dysintegration of the breathing movements during stuttering. Arch. Neurol. and Psychiatry 18 (5): 1927. Biol. Abs. 4 (2): 4673.

to be interpreted by the operator-control, thus enabling him to control the nature and timing of stimuli.

In general, each kymograph breathing record consisted of three parts:

Section I. Curves of normal breathing before any training for that day;

Section II. Curves of breathing during alternate periods of stimulus and recovery; and

Section III. Curves of normal breathing at the end of training for that day.

This standard order of procedure in the taking of kymograph records enabled one to study:

1. Type of breathing before training of any kind;
2. Immediate breathing response to stimulus;
3. Effect accumulated at end of each training period; and
4. Carry-over effect from one record or training period to another.

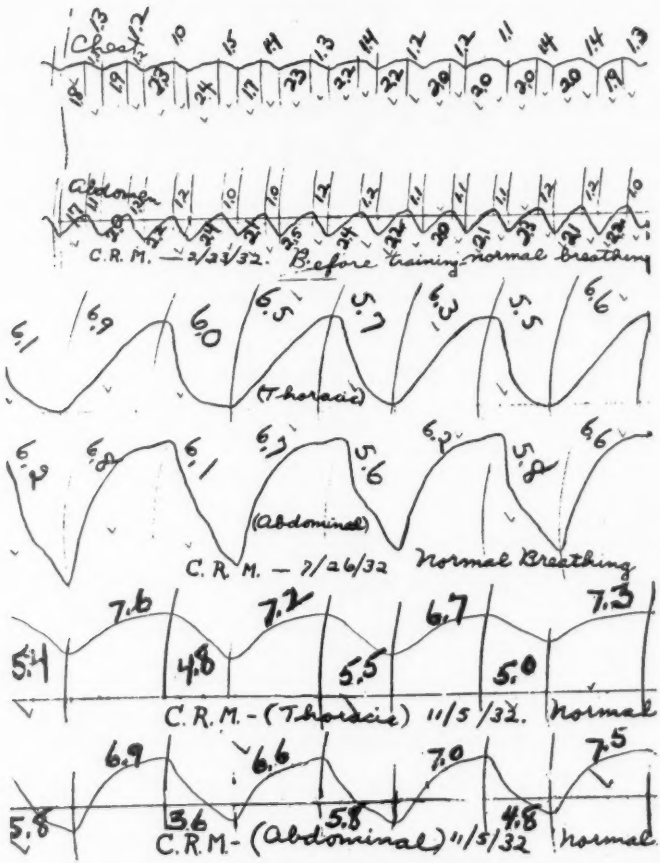
As a general rule, the first training began with simple counting—sometimes by control alone, sometimes by subject alone, sometimes by both—having a one-two-three-four frame-work, with whatever variations that appeared to be best adapted to the particular subject, or to which the subject would appear to respond best. The counting was aloud, providing an auditory stimulus, which usually was sufficient to produce response. Sometimes, however (varying with the subject), it was necessary or helpful to use visual, pressure, or other types of stimuli[14] before definite responses could be noted. By gradually extending or shortening the period of count, attempt was made to vary the duration of the breath, hence the rate of breathing, and the depth of breathing. The degree of success depended in large measure upon the proper timing of the stimulus, and upon the control's ability to sense the subject's approach of fatigue. During this counting, the subject was encouraged to accent freely with gestures of various parts of the body—thus rhythmically correlating other bodily movements of expression with the movements essential for speech.

Later on in the training a series of vowels was substituted for the counting; and finally, connected series of vowels and consonants, or groups of hyphae, as appearing in normal oral reading and speaking, were employed. Most utterance was with variations in melody and accent.

Analysis of Data

A general inspection of the breathing curves made before training revealed the existence of breathing disturbances for practically all subjects—such disturbances as rapid breathing, shallow breathing,

[14]An olfactory stimulus was not tried, but the author is of the opinion that it could be used with success.


Chest
Abdomen
C. R. M. — 2/23/32. Before training. Normal breathing
(Thoracic)
(Abdominal)
C. R. M. — 7/26/32 Normal Breathing
C. R. M. - (Thoracic) 11/5/32. Normal
C. R. M. - (Abdominal) 11/5/32 Normal

CURVES OF NORMAL BREATHING BEFORE AND AFTER RE-RHYTHMIZATION

(Inspiration—down; expiration—up; numbers indicate duration in seconds. Record No. 1 was taken February 23, before training. The last date of training was May 7th. The last two records, Nos. 24 and 25, were taken July 26th and November 5th, respectively, and indicate retention of the new rate of breathing.)

and irregular breathing—phenomena already observed by Travis and others.

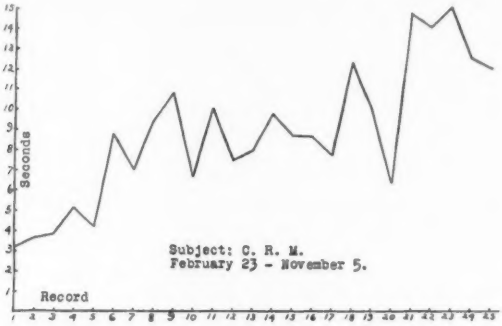
Then a more detailed analysis, especially as to duration of inspiration and expiration, was made of the breathing curves of those subjects who appeared repeatedly for training. This data was tabulated, together with a running description of the training involved, and other information which it was thought might be pertinent. Tables I to IX refer to 9 subjects, each of whom appeared at the laboratory 8 or more times; and Table X, which accompanies this article, is based on information contained in Tables I to IX, inclusive.[15] Table X gives the duration, in seconds, of the average normal breath, and the duration ratios of inspiration to expiration of the average normal breath, at the beginning of each record of the respective 9 subjects. The effect of training on the duration of breath, or rate of breathing, of these 9 subjects, is illustrated by the 9 unsmoothed curves presented herewith, values for which are found in Table X. The portions of kymograph breathing records reproduced herewith are from the beginnings of records numbered 1, 24 and 25 of subject CRM (Compare corresponding values in Table X and graph for CRM), and suggest clearly the type of change in rate and depth of breathing that was obtained throughout this investigation. The high degree of permanency in the newly established rate of breathing is also at once apparent from a comparison of the kymograph breathing curves for July 26th and November 5th, respectively, when it is noted that this subject received no training for breathing after May 7th.

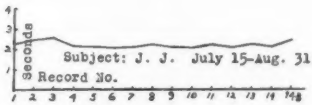
The curve of subject J. J. merits particular attention at this time, because it appears to indicate lack of response to training. This subject was a chunky lad of 12 years, who was deficient in thyroid as a result of whooping cough, and had a low metabolic rate. He did not appear to yield to training, except for a few seconds at a time, until his next to last appearance at the laboratory, August 18th, which was about 10 days after his physician had begun giving him thyroid extract treatments. When he last appeared, on August 31st, there was considerable response to training, and evidence of some effect carried over from the training given on August 18th. We regret, for the purpose of making one or two more kymograph records, that this subject never came to the laboratory again; but inquiry revealed that his breathing had improved so much he could swim and participate in sports generally—his former shallow and irregular breathing, and rate of 25–30 breaths per minute, had prevented this—he had gained in confidence, his stuttering had practically disappeared, and there was no felt need for returning to the laboratory. Further discussion in regard to this and other subjects is contained in Chapter IV of the dissertation.

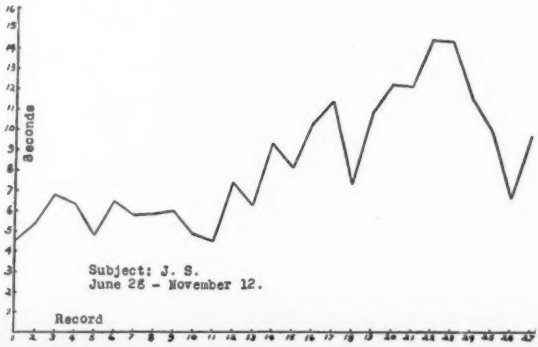
[15]Although all tables and graphs were examined by the doctoral committee, only Table 4, an extract (Subject CRM) of Table 10, and Graphs 4 (CRM) and 10 (A composite of Graphs 1 to 9, inclusive), were included in the bound copies of the dissertation.

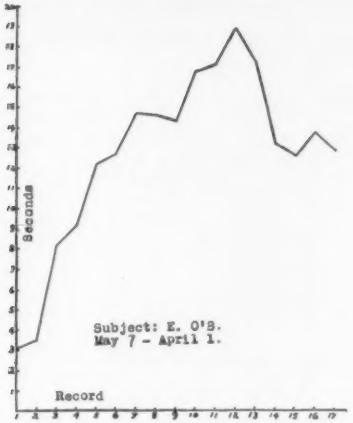
UNSMOOTHED CURVES OF LEARNING NEW RATES OF BREATHING DURING TRAINING IN RE-RHYTHMIZATION OF THE BREATHING OF STUTTERERS

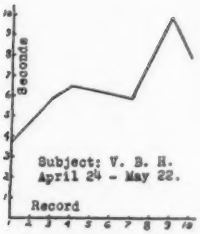
(Based on numbers in "Duration" column of Table X. Vertical scale indicates average number of seconds' duration of breath at the beginning of each breathing record.)

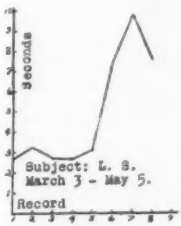


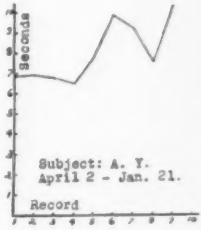


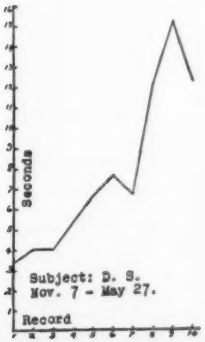



Seconds
Subject: E. O'S.
May 7 - April 1.
Record


Seconds
Subject: V. B. H.
April 24 - May 22.
Record


Seconds
Subject: L. S.
March 3 - May 5.
Record


Seconds
Subject: A. Y.
April 2 - Jan. 21.
Record


Seconds
Subject: D. S.
Nov. 7 - May 27.
Record

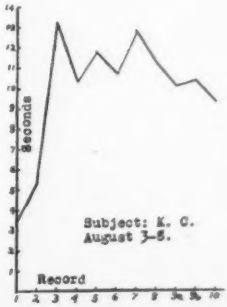

Seconds
Subject: K. C.
August 3-8.
Record

TABLE X[16]

VALUES OF AVERAGE NORMAL BREATH AT BEGINNING OF EACH RECORD

Name of Subject	Record		Duration (Seconds)	I/E Ratio	
	Date	No.		Thor.	Abd.
	1932				
Subject: K. C.....	8-3	1	3.55	.441	.601
	8-3	2	5.43	.658	.636
	8-4	3	13.10	.265	.305
	8-5	4	10.43	.510	.461
	8-5	5	11.81	.746	.763
	8-6	6	10.68	.753	.684
	8-6	7	12.81	.618	.536
	8-7	8	11.14	1.022	.856
	8-8	9a	10.03	.808	.662
	8-8	9b	10.34	.765	.797
	8-8	10	9.39	.814	.726
	1932				
Subject: V. B. H.....	4-24	1	3.76	.699	.650
	4-28	2	4.80	.940	.626
	5-1	3	5.94	.760	.741
	5-1	4	6.49	.598	.599
	5-3	5	6.31	.819	.695
	5-3	6	6.07	.531	.541
	5-5	7	5.91	.678	.542
	5-10	8	7.91	.684	.689
	5-17	9	9.83	.605	.942
	5-22	10	7.98	.866	1.007
	1932				
Subject: J. J.....	7-15	1	2.27	.833	.746
	7-18	2	2.46	.578	.518
	7-18	3	2.49	.554	.515
	7-21	4	2.14	1.044	.770
	7-25	5	2.06	.745	.914
	7-28	6	2.01	.838	.671
	7-28	7	2.03	.735	.759
	8-1	8	2.19	.806	.674
	8-1	9	2.05	.718	.722
	8-4	10	2.03	.828	.795
	8-8	11	2.18	.690	.709
	8-8	12	2.04	.642	.672
	8-11	13	2.25	.739	.714
	8-18	14	2.09	.821	.805
	8-31	14-B	2.46	.929	.831
	1932				
Subject: C. R. M.....	2-23	1	3.25	.594	.590
	2-27	2	3.72	.731	.671
	3-1	3	3.94	.631	.595
	3-3	4	5.10	.851	.857
	3-3	5	4.24	.597	.497
	3-5	6	8.75	.379	.357
	3-7	7	7.00	.483	.458

[16]Tables I to IX are not included in this article. See footnote 15.

TABLE X—*Continued*

Name of Subject	Record		Duration (Seconds)	I/E Ratio	
	Date	No.		Thor.	Abd.
	1932				
Subject: C.R.M. (*Continued*)	3-8	8	9.48	.384	.331
	3-10	9	10.71	.520	.431
	3-11	10	6.67	.394	.362
	3-12	11	9.97	.550	.480
	3-14	12	7.45	.512	.495
	3-15	13	7.96	.654	.595
	4-5	14	9.68	.540	.519
	4-7	15	8.66	.423	.461
	4-7	16	8.60	.480	.459
	4-8	17	7.68	.444	.413
	4-21	18	12.18	.608	.186
	4-26	19	9.97	.550	.494
	4-28	20	6.44	.448	.466
	4-30	21	14.70	.719	.718
	4-30	22	14.04	.785	.751
	5-7	23	14.99	.857	.916
	7-26	24	12.51	.877	.879
	11-5	25	11.98	.744	.746
	1932				
Subject: E. O'B.	5-7	1	3.06	1.497	.766
	5-10	2	3.53	1.066	.669
	5-11	3	8.15	.691	.456
	5-14	4	9.20	.716	.635
	5-17	5	12.22	.589	.474
	5-21	6	12.77	.727	.412
	5-24	7	14.72	.646	.537
	5-26	8	14.64	.339	.282
	5-28	9	14.33	.517	.236
	10-8	10	16.85	.262	.225
	10-11	11	17.13	.325	.285
	10-18	12	18.93	.255	.216
	11-8	13	17.23	.439	.233
	11-15	14	13.18	.717	.597
	12-6	15	12.56	.928	.842
	1933				
	1-14	16	13.73	.840	.732
	4-1	17	12.84	.676	.570
	1932				
Subject: D. S.	10-7	1	3.46	.764	.639
	10-11	2	4.05	.765	.608
	10-18	3	4.03	.982	.770
	10-20	4	5.49	1.154	.861
	12-6	5	6.64	1.055	.901
	1933				
	3-25	6	7.60	1.794	.882
	4-22	7	6.72	.941	.909
	4-29	8	12.11	1.068	.943
	5-20	9	15.14	1.073	.785
	5-27	10	12.20	.946	.860

TABLE X—*Continued*

Name of Subject	Record		Duration (Seconds)	I/E Ratio	
	Date	No.		Thor.	Abd.
	1932				
Subject: J. S.	6-28	1	4.52	1.124	.589
	6-29	2	5.42	1.393	.800
	6-29	3	6.82	1.456	.544
	6-30	4	6.28	.954	.861
	7-1	5	4.85	.876	1.019
	7-5	6	6.48	1.028	.628
	7-5	7	5.80	.780	.756
	7-6	8	5.84	.767	.669
	7-6	9	5.99	.774	.561
	7-7	10	4.84	.893	.760
	7-7	11	4.53	1.063	.527
	7-12	12	7.31	.815	.517
	7-13	13	6.24	.819	.449
	7-15	14	9.17	.810	.597
	7-20	15	8.10	.912	.533
	7-21	16	10.41	1.150	.613
	7-22	17	11.39	.948	.583
	7-26	18	7.37	.910	.611
	7-27	19	16.88	.779	.570
	7-28	20	12.17	.690	.470
	7-28	21	12.05	.745	.565
	8-3	22	14.38	.619	.688
	8-10	23	14.29	.814	.729
	8-11	24	11.46	1.508	.852
	8-23	25	9.91	.815	.715
	8-23	26	6.60	1.048	1.344
	11-12	27	9.68	.704	.847
	1932				
Subject: L. S.	3-3	1	2.68	.628	.680
	3-15	2	3.17	.540	.614
	3-22	3	2.73	.579	.506
	3-29	4	2.68	.480	.726
	4-5	5	3.06	.655	.665
	4-28	6	7.50	.820	.795
	5-3	7	9.78	.794	.724
	5-5	8	7.56	.715	.752
	1932				
Subject: A. Y.	4-2	1	6.90	.901	.702
	4-23	2	6.92	.693	.721
	4-30	3	6.84	.795	.712
	5-21	4	6.52	.816	.736
	5-28	5	7.87	1.141	.786
	7-12	6	9.86	.661	.570
	7-13	7	9.20	.618	.616
	7-28	8	7.58	.763	.739
	1933				
	1-21	9	10.24	.603	.634

Conclusions

In brief, the following are some of the conclusions of this investigation:

A. Conclusions established by the data:

1. New breathing rhythms, especially slower in rate and deeper in inspiration, can be established by training.
2. Breathing rhythms thus established have a high degree of permanency.
3. The re-rhythmization of breathing is a basis for improvement in the speech of stutterers.
4. Re-rhythmization of the breathing of stutterers is conducive to improvement in activities other than speech, in general health, and in mental attitude.
5. The breathing disturbance of stutterers is more abdominal than thoracic.

B. Probable conclusions suggested by the data:

6. The disturbed speech rhythm of stutterers may be due, at least in part, to disturbed breathing rhythm, which in turn may be due to disturbed nutrition.
7. The disturbed breathing rhythm resulting from disturbed nutrition, and the consequent disturbed speech rhythm of some stutterers, become fixed habits that may persist even after nutrition has become corrected.
8. Disturbances in the breathing and speech rhythms of stutterers cannot well be removed until after the causative organic disturbances have been removed.
9. One of the offices of the teacher of speech in the treatment of stuttering lies in re-rhythmizing the breathing and speech after the causative organic disturbances have been removed.
10. The normal speech phrase is a rhythmic unit within the rhythm of breathing.

‡ OBITUARY ‡

Dr. M. A. Goldstein, Noted Teacher of Deaf, Dies

Dr. Max A. Goldstein, internationally-known founder and director of the Central Institute for the Deaf, 818 South Kingshighway, St. Louis, Missouri, died suddenly July 27, 1941, at his summer home at Frankfort, Michigan, where he had been vacationing with his wife, Mrs. Lenore Weiner Goldstein. He was 71. His death occurred shortly after 4 P. M., apparently from a paralytic stroke. For he had suffered a paralytic stroke last January, recovering sufficiently to resume some of his duties at the Institute. He left for Michigan about four weeks previously.

Dr. Goldstein practiced as an eye, ear, nose, and throat specialist in St. Louis for almost 50 years. He founded the Central Institute for the oral instruction of the deaf in 1914. In 1933, he was presented the St. Louis Award for 1932–33 in recognition of achievements and research during 40 years in dealing with the problems of the deaf.

The Central Institute, a four-story building which provides quarters for 70 resident students and 30 full-time students, in addition to clinics, classrooms and research quarters for the Institute's Teachers College, is a monument to Dr. Goldstein's skill.

At the celebration of "old grad week" last summer at the Institute, graduates from 14 states and Canada returned to tell an inspiring story of accomplishments of Central Institute in relating their success in earning their living in competition with hearing persons. As medical technicians, farmers, secretaries, typists, librarians, research workers, clerks, and college students they had overcome handicaps to find happiness and success in chosen fields.

Dr. Goldstein studied in Vienna in 1893 under Dr. Adam Politzer. When he returned to St. Louis to practice nearly 50 years ago, Dr. Goldstein had unusual success in teaching deaf children in an experiment in which he was aided by the St. Joseph School for the Deaf. The necessity of earning a living forced these classes into the background until 1914, when Central Institute was founded in rooms over his offices.

The institute's teachers' college has graduated more than 700 students, many of whom came from foreign countries.

Dr. Goldstein received wide recognition for his work and was a former president of the American Laryngological, Rhinological and Otological Society, The American Speech Correction Association, the Society of Progressive Oral Advocates, the National forum on Deafness and Speech Pathology, and other medical groups.

In 1896, he founded the Laryngoscope, a scientific journal international in scope, which he has edited since. He also founded the St. Louis Art League.

He was also a former professor of otology at the St. Louis University School of Medicine.

G. Oscar Russell.

A COMPARATIVE STUDY OF THE SALIVARY pH[1] OF THE NORMAL SPEAKER AND STUTTERER

JEANNETTE HAFFORD,
University of Wisconsin

In 1922, Henry E. Starr[2], at the University of Pennsylvania, advanced the theory that the pH of human saliva is directly dependent on the ratio of "free" to "fixed" carbon dioxide in the saliva. Starr divided a number of stammerers[3] into two groups: *sub-breathers* and *hyperexcitable psychopaths*. Using a group of normal individuals as a control, he determined salivary pH and carbon dioxide content of the alveolar air, and found that the sub-breathers as a class had a characteristically low pH and a high carbon dioxide content, while the psychopaths had a high pH and a low carbon dioxide content. Reasoning from these findings, Starr believed that pH, taken in conjunction with carbon dioxide determinations on the saliva, may be of important diagnostic value as an index of (1) the condition of fatigue and breathing habits (2) the degree of emotional excitement and (3) the excitability of the individual.

Starr's unique results have been much quoted and have colored the opinions of other workers throughout the literature. However, work tending to confirm or deny Starr's findings has been scarce. The author knows of but one case, that of George A. Kopp, who advanced important evidence in refutation of much of Starr's work. Starr believes that the pH and carbon dioxide content of the blood of sub-breathing stutterers is lower and higher respectively than that of normal individuals. Kopp[4] studied the pH and carbon dioxide content of the blood of a number of stutterers, and found that there was definitely no significant difference. In connection with this work, he further studied the alveolar carbon dioxide of 19 stutterers and 19 normal speakers and was unable to demonstrate in any way that the stutterers were different from the normal group.[5] It is Starr's original work and Kopp's negative findings that have prompted to a large degree, the undertaking of the present study. It was felt that additional evidence was required.

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[1]pH is the negative logarithm of the hydrogen-ion concentration.

[2]Starr, H. E. "The Hydrogen-ion Concentration of the Mixed Saliva," *Am. J. Psychol.*, Vol. XXXIII, p. 394 (1922).

[3]There is no definite difference between stuttering and stammering. Stuttering now applies to all cases.

[4]Kopp, G. A. Metabolic Studies of Stutterers, *Speech Monographs*, Vol. I, No. 1, September, 1934.

[5]See Kopp, G. A., Ph. D. thesis, University of Wisconsin, 1933. (Unpublished.)

Studies on salivary pH to date show, and are significant for, their many contradictions and confusions. Difficulties in the method of collection, inadequacy of pH determinations, and lack of standardization of conditions under which the experiments have taken place have probably been the primary sources of error and inconsistency.

The most universal method of collection has been expectoration. In collection by expectoration in any form, whether in a basin supplied with an indicator, in a lipless pyrex tube containing a little liquid paraffin, in a funnel leading below a surface of oil in a test tube, or in transference from the mouth to an electrode vessel, there is a possible loss of carbon dioxide and a possible contamination by foreign substances.

It is generally believed that carbon dioxide pressure in the mouth greatly influences the salivary pH, and that it is more or less in a state of flux as soon as the saliva leaves the mouth. Since the carbon dioxide content and hence the pH of the saliva is nearer its true value as the saliva is retained, a method should be constructed in which the saliva remains in the mouth. Then, during the determination, the saliva retains the carbon dioxide tension of the expired air, and a more accurate measure of salivary pH results. In almost every case there has been an attempt to eliminate the error due to loss of this gas.

A careful study of the literature has revealed the techniques used in pH studies and some of their inadequacies as given in the following table:

TECHNIQUE	INADEQUACIES
Colorimetric	1. This procedure usually involves the dilution with H_2O and always the addition of a foreign matter, the indicator. Its usefulness is limited.
	2. Indicator paper (litmus) is only qualitative, the results being reported simply as acid or alkaline.
	3. Determinations are made outside the oral cavity. The use of discs impregnated with an indicator for use in the mouth involves the removal from the mouth, washing and comparison with a standard outside of the mouth.
Titrimetric	1. This method involves titration with acid or base to a definite color of an indicator. The results are "acid" or "base" neutralizing power and are a poor measure of pH. Methyl orange is often used, and there is an uncertainty in the methyl orange end point in solutions like saliva.
Electrometric	1. The Hydrogen electrode is difficult to use in complex solutions due to the ease of "poisoning" the electrode. Hydrogen has to be bubbled into the solution. Determinations must be made outside of the mouth.
	2. The Quinhydrone electrode involves the saturation with quinhydrone of the solution on which pH is to be determined, and the determination must be done outside the mouth.
	3. The glass electrode method is one of the most widely accepted methods of determining pH in Biological fluids, but no methods were found in which it was inserted directly into the mouth.

TECHNIQUE	INADEQUACIES
Centrifuging, Boiling, Dialyzing, Filtering	1. Starr and others maintain that these procedures alter resting saliva.
Delayed Determinations	1. pH changes on standing due to loss of carbon dioxide, foreign contaminants and bacterial action so that it is in no wise comparable to that existing in the mouth.

In addition to the confusions arising from the many different methods of the determination of pH and their incompatibilities, there has been a sad lack of standardization of the condition of the subject, and hence his saliva, in previous studies. Since the salivary pH is such a variable measure, being subjected to change by so many factors, it is essential that these influences be reduced to a minimum and that previous to the determination each subject should be exposed to some common treatment. Such items as the following may be possible factors affecting the reliability of the salivary pH measurement and should be standardized in any investigation concerning it.

1. Age.
2. Sex.
3. Condition of fatigue (rest).
4. Brushing of teeth.
5. Condition of teeth.
6. Condition of mouth with respect to oral infection—canker sores, pyorrhea, etc.
7. Condition of nose and throat such as colds, sore throats and sinus.
8. Amount of chewing, eating and talking done previous to determination.
9. Amount of smoking previous to determination.
10. Amount of olfactory, auditory, and visual stimuli preceding determination.
12. Amount of emotion or pain including hunger pains.
13. Dietary condition.
14. Homogeneity of collection.
15. Time of determination with reference to food intake.

The difference which may occur between the normal speaker and stutterer as well as the turmoil which exists in the methods of collection, the inadequacies of pH determinations, and the lack of standardization of conditions under which the experiments have taken place, has, in part, instigated this experiment. Briefly, the pertinent reasons for the experiment are:

1. The scientific improvement of the method and technique involved in pH determinations on saliva.
2. A more thorough standardization of conditions under which the experiment takes place.
3. To determine whether the saliva of the stutterer is more acid than that of the normal speaker on the basis of saliva secreted

with as little induced stimulation as possible, called by other investigators by the somewhat inadequate term *resting saliva*.[6]

4. To determine if the stuttering spasm causes a higher pH than normal speaking.
5. To determine if there is a greater pH change from resting saliva per se to resting saliva which has been activated by the process of speaking.
6. To determine if the pH of the saliva is significant in diagnosis.

The glass electrode method, one of the most widely used methods for determining pH, has proved most satisfactory. This method was appropriated for the determination of the salivary pH in the mouth of the subject, or in the actual environment with complete retention of carbon dioxide as it naturally exists in the closed oral cavity. It was necessary to choose between determining the salivary pH by removal of saliva from the mouth and subjecting it to all the errors previously stated, or the determination "in situ" with a possible error due to pH change by a slight stimulus of the rate of flow of the saliva. In any case some stimulation must occur in order to collect enough saliva for a reading. However, the instrument remained in the mouth for such a brief interval that the stimulation was undoubtedly negligible. A study of the changes which take place can be observed without collecting samples and thereby with no time lapse between collection and determination. A greater number of readings may be taken in a given period of time, and therefore a closer study of the fluctuations in pH may be made.

Method

The essential apparatus consisted of a glass indicator electrode, a calomel reference electrode with a saturated potassium chloride bridge, and a Beckman pH meter. The glass electrode was made by blowing a thin small bulb of electrode glass (Corning 015) on the end of an 8 inch piece of 4 or 6 mm. soft glass tubing. The electrode was soaked in .1 N hydrochloric acid for a few days, and then filled with .1 N hydrochloric acid. Electrical contact was made with this liquid by means of a platinum wire sealed in a glass tube that would fit inside the electrode tube. A female jack was fitted to the end of the platinum wire. The calomel cell was made by sealing a piece of 4 mm. glass tubing at a slight downward angle to a small test tube. The other end of the tubing was sealed over a small thread of asbestos to provide a slight leak for the potassium chloride bridge. A mixture of saturated potassium chloride, mercury and calomel (Hg_2Cl_2) was placed in the bottom of the test tube and covered with a small well of mercury. A platinum wire sealed in a glass tube fitted with a female jack as previously described was thrust below the surface of the mercury into the calomel mixture. The side arm tube and the test tube were then both filled with saturated potassium chloride. The cell was assembled by simply clamping the glass electrode to the

[6]Resting saliva is taken as the saliva after the 15 minute rest period initiating the experiment. Robert E. Brawley defines resting saliva as saliva secreted without any form of induced stimulation.

side arm of the calomel cell with rubber bands. When not in use, the assembled cell was kept tilted so that the glass electrode could be kept in a beaker of distilled water. When in use, the assembly was clamped to a ring stand with the glass electrode protruding at a slight downward angle. The leak of salt through the asbestos was too slow to be tasted when taken into the mouth. Connection was made with the Beckman pH meter by means of two wires fitted with male jacks at either end.

Before use, each day, the cell was checked against four phosphate buffer solutions of pH 6.41, 6.90, 7.15 and 7.68. If these readings did not exactly correspond, a curve of the actual readings against the buffers was drawn, and the pH readings taken later were corrected to the true value. The probable limit of error of the determinations was .02 of a pH unit.

In taking the readings, the glass electrode and the side arm of the calomel cell were inserted into the mouth under the tongue. The mouth was closed over the electrodes and the first steady pH reading obtained was used. No measurement took longer than 45 seconds.

The fluids produced in the mouth include the secretions from the salivary and mucous glands as well as a number of leucocytes which have transversed the epithelium. The saliva is secreted by three pairs of large salivary glands having ducts and numerous small accessory salivary glands that communicate with the oral cavity. These glands are the parotid, submaxillary, and sublingual.

The parotid and submaxillary glands function more intermittently than the other glands, the greatest secretions accompanying the chewing process (particularly of food). The sublingual, molar, submaxillary and palatine keep the mouth moist. The saliva, however, naturally accumulates during the period of rest under the tongue. Since the accumulation occurs fluently during nonactivation of the musculature of the oral cavity, the stimulation of this natural occurrance is probably negligible. It is further probable that this mixed accumulated saliva situated under the tongue makes up the greater part of the saliva affected when speech occurs. For this reason, and since investigation with the glass electrode in other parts of the oral cavity, especially on the top of the tongue, did not give a steady pH reading it was decided that the determination of pH under the tongue would give the best representation of the pH of human mixed saliva. This location also afforded the least possibility of breakage and the electrode was most comfortably held there by the subject.

The nineteen normal speakers and nineteen stutterers who participated in the experiment were taken from college and graduate students of the University of Wisconsin. The normal speakers were devoid of any noticeable speech defect such as lisping, stuttering, or more than a normal hesitancy. Furthermore their case histories revealed no such defects. The stutterers were taken from subjects of the Speech Clinic of the University of Wisconsin in various corrective stages; from obvious stutterers outside of the clinic; and from subjects of other clinics. The two groups were paired according

to age within two months of their birthdates. The pairing was done on the basis of sex, age, sinus infection and condition of teeth.

A 15-minute rest period void from all talking, reading or mental activity (as nearly as possible) initiated the experiment. Immediately after this period before any activation of the jaw took place, the glass electrode was put under the tongue and the pH determined. A short talking period followed in which the stutterers were caught in a spasm or block. Another talking period followed which, in turn, was succeeded by two reading periods, a five minute rest period and two more reading periods. pH determinations were made after each activation, and all readings were taken alternately between the normal speakers and the stutterers. In all cases the pH readings immediately followed the resting, speaking or reading period. All the reading selections were the same for both groups, and the entire procedure was explained carefully to the subjects previous to the experiment in order to minimize and standardize any emotional excitation caused by the procedure. Excellent co-operation was obtained in all cases.

The conditions under which the subjects were standardized were:

1. Eight to ten hours sleep.
2. Breakfast at 7:00 A. M., being completed by 7:30 A. M.
3. Teeth brushed immediately after breakfast and the mouth washed out with clear water.[7]
4. No smoking from the time of rest the previous night until after the experiment.
5. No chewing, eating, or drinking (except water if absolutely necessary) from the breakfast and tooth brushing period in the morning.
6. Avoidance, as far as possible, of strong odors, loud noise, or shock of any kind.
7. Avoidance, as far as possible, of strong emotion or excitement during the hours preceding the experiment.
8. Avoidance of physical exercise except the amount necessary in walking to classes. Avoidance of excess talking or exercise of the mouth from arising in the morning until the speaking period of the experiment.
9. Elimination of any subject with sinus infection excepting when a normal speaker was paired with a stutterer of approximately the same degree of infection.
10. Elimination of any subject having a cold, sore throat, or oral infection such as canker sores, pyorrhea, etc., at the time of the experiment.
11. The experiment took place from two to three hours after the breakfast period and from one and a half to two hours before noon luncheon.[8] All experiments took place in the morning.

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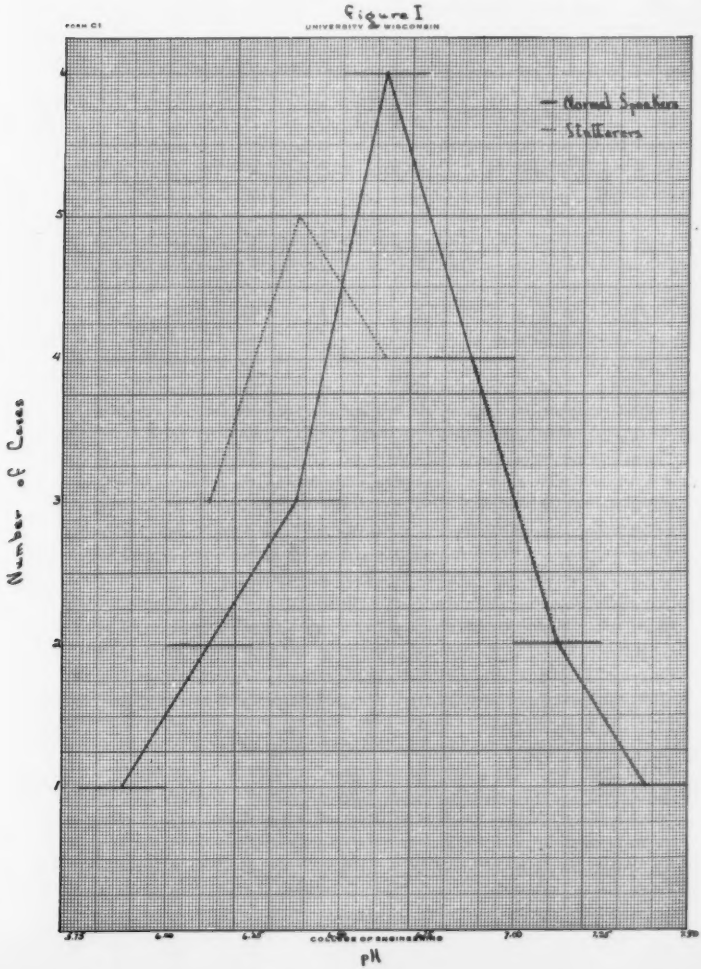
[7]This was deemed advisable in order that no food particles remain in the mouth during the morning before the experiment.

[8]The pH of the saliva has been found to fluctuate less during this period: Brawley, R. E., *J. of Dental, Research* Vol. XV, p. 79 (1935); Henderson, M., and Millet, J. A. P., *J. of Biological Chemistry*, Vol. LXXV, p. 559 (1928); Forbes, J. C., *J. of Dental Research*, Vol. XII, p. 637 (1932).

12. The room in which the determinations were made was practically free from noises and odors.

The above conditions were rigorously adhered to in order to obtain the best possible standardization under the conditions of the experiment. Certain other items in the standardization, such as diet, could not be completely regulated and were accordingly waived.



Results

Figure 1 is a Frequency Distribution Graph of the Resting Saliva of the stuttering group (dotted line) and of the normal group (unbroken line). It is seen that the general trends are approximately the same. The average pH of the Resting Saliva of the normal speakers was 6.62, while that of the stutterers was 6.60.

The statistical treatment of the 49 possible pairs of columns of data by the method of calculating the significance of the difference between means revealed absolutely no significant difference in any case.

As a check on the above statistics, and in order to determine whether pairing of stutterers and normal speakers shows any significance a further statistical method of treatment by pairs was applied with negative results shown in Table I.

TABLE I

CORRELATION BY PAIRS

Comparison	St. Dev.	St. Error	Diff of $\frac{\Sigma\Delta^*}{N}$ from Zero
Resting Saliva of Normals—Resting Saliva of Stutterers.....	.56	.13	.03
Post Speaking Saliva No. 1† of Normals—Post Speaking Saliva No. 1 of Stutterers.....	.50	.11	.01
Post Reading Saliva No. 1‡ of Normals—Post Reading Saliva No. 1 of Stutterers.....	.50	.11	.07
Post Reading Saliva No. 3§ of Normals—Post Reading Saliva No. 3 of Stutterers.....	.54	.13	.03

*$\frac{\Sigma\Delta}{N}$ —Average difference from the mean.

†Post Speaking Saliva No. 1 is Resting Saliva which has been activated by the process of speaking.

‡Post Reading Saliva No. 1 is Post Speaking Saliva further activated by the process of reading aloud.

§Post Reading Saliva No. 3 is Post Reading Saliva further activated by more reading after a five-minute rest period.

For the purpose of determining if changes in pH during activation are significantly different for normal speakers and stutterers Table II was compiled.

TABLE II

CHANGES IN pH DURING ACTIVATION

Comparison	St. Dev.	St. Error Diff. of	$\frac{\Sigma \Delta}{N}$ from Zero
Change from Resting Saliva to Post Speaking Saliva No. 1 of Normals and of Stutterers.....	.44	.10	.01
Change from Post Speaking Saliva No. 1 to Post Speaking Saliva No. 2* of Normals and of Stutterers.....	.30	.07	.11
Change from Post Reading Saliva No. 1 to Post Reading Saliva No. 2† of Normals and of Stutterers.....	.42	.10	.08
Change from Post Reading Saliva No. 3 to Post Reading Saliva No. 4‡ of Normals and of Stutterers.....	.21	.05	.02
Change from Resting Saliva to Post Reading Saliva No. 1 of Normals and of Stutterers.....	.47	.11	.04
Change from Resting Saliva to Post Reading Saliva No. 4 of Normals and of Stutterers.....	.33	.08	.04
Change from Post Reading Saliva No. 2 to Post Reading Saliva No. 3 of Normals and of Stutterers.....	.43	.10	.04

*Post Speaking Saliva No. 2 is Post Speaking Saliva No. 1 further activated by more speaking.

†Post Reading Saliva No. 2 is Post Reading Saliva No. 1 further activated by more reading.

‡Post Reading Saliva No. 4 is Post Reading Saliva No. 3 further activated by more reading.

The change from Post Speaking Saliva No. 1 to Post Speaking Saliva No. 2 of normals showed the greatest possibility of being significantly different from that of stutterers, and therefore it was examined in greater detail.

The mean for the pH determination of the stutterer's first spasm while talking was 6.56, and the standard deviation was .38. That of the stutterer's second spasm or block was 6.66 and the standard deviation was again .38. The actual difference between the means was .10, and the standard error of difference between the means was .13. The mean for the normal speaker's first activation of the mouth in talking was 6.57, with a standard deviation of .41. That of the

second activation in speaking was 6.57, the standard deviation being .27. The actual difference between the means was 0.00, and the standard error of difference between the means was .11. The comparison of Post Speaking Saliva No. 1 with Post Speaking Saliva No. 2 is as follows:

Groups	St. Dev.	St. Error	Diff. of $\frac{\Sigma \Delta}{N}$ from Zero
Normals	.26	.06	.00
Stutterers	.20	.05	.10

It is seen that the difference from 0 is less than the standard error in the case of the normal speakers and only twice the standard error in the case of the stutterers.

Conclusions

There is no significant difference between the Resting Saliva of normal speakers and stutterers taken on the basis of these 19 cases. There is also no significant difference after activation of the oral cavity by speaking and reading aloud.

There is no significant difference between stutterers and normal speakers with reference to salivary pH changes from the Resting Saliva to various stages of activation and between various stages of activation.

The nearest approach to a significant difference between normal speakers and stutterers was in the change in pH produced in the second activation by speaking. The difference of the mean deviation of the changes of normal speakers and stutterers $\left(\frac{\Sigma \Delta}{N}\right)$ from zero was .11, while the standard error in computing that number was .07. While this is not by any means a *significant* variation, it seemed advisable to trace it. By further examination it was found that the slight deviation noted above was due on the one hand to a greater than average change in pH on the part of the stutterers, and on the other to a less than average change on the part of the normal speakers.

The individual variations in pH seem to be too large to attach any significance to minor statistical variations. As a corollary: pH change should prove of little value in diagnosing cases. In other words the statistical differences are probably of less importance and of smaller magnitude than the individual pH changes.

The pairing as to age group, condition of teeth, sinus infection, etc., was not shown to cause any significant variation by the results of these cases as determined by the two different statistical methods.

The data collected in this experiment seem to indicate that the pH of the saliva of stutterers is not significantly different from that

of normal speakers, as some workers have believed. It should be remembered again that the determination of pH "in situ" as used above should cancel errors made in expectoration methods as previously applied.

The above results and conclusions differ from those of Henry E. Starr probably because of a number of factors. Although Starr used a greater number of cases, his technique—a colorimetric method involving the use of bromthymol blue and phenol red as indicators—was such that it implied a large possibility of error. His collection method in the work specifically concerned with stammerers did not employ the collection of saliva under oil, which he himself recommended strongly, and was therefore subjected to a sizeable correction. His method involved the pouring of the saliva, diluent (distilled water) and indicator back and forth between two test tubes, probably resulting in the loss of varying amounts of carbon dioxide. Starr required his subjects to hold the saliva in the mouth without swallowing for a period of five minutes. This is in itself an abnormal reaction which may have had varying effects on the different individuals. The time lapse between collection and determination, however short, brings forth the possibility of a great many disturbing factors. In the method presented in this paper, this time lapse is practically non-existent.

Starr makes no mention of the condition of his subjects in the initial portion of his experiment other than that the subjects were normal healthy individuals, sub-breathers and hyperexcitable psychopaths. If these subjects began the experiment in varying conditions of fatigue and unnatural breathing, time of day, etc., the results are bound to be somewhat affected.

Starr states that pH (or hydrogen ion concentration) when taken *in conjunction with the carbon dioxide content of the saliva* is of definite value in diagnosing metabolic and emotional states—that is, in distinguishing sub-breathers, normals and psychopaths. If, however, the results set forth in this paper are a true indication of actuality, the pH is of no diagnostic value whatever, and any diagnosis made with the aid of pH and carbon dioxide content depends entirely on the carbon dioxide content. This is necessarily true for two reasons: first, the individual variations in pH were found to be too great to be of any significance; and second, the statistical averages of normal speakers and stutterers were found to be the same by the glass electrode method. Furthermore, the work of George Kopp, who was unable to find any difference in the alveolar carbon dioxide of stutterers and normal speakers, indicates that the use of carbon dioxide content in diagnosis is worthless. There were no evidences in the present group of 19 stutterers which warrant their being divided into sub-breathers and psychopaths as Starr did, but the utter lack of any significant difference between the stutterers and normal speakers is the best possible argument in itself against the use of pH in diagnosis.

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CHEWING METHOD APPLIED IN CASES OF PHARYNGEAL DRYNESS OF ORGANIC OR PSYCHOGENIC ORIGIN

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Many singers, public speakers and actors suffer from stage-fright and fits of agony before their appearance, and at the same time complain about a torturing feeling of dryness in the mouth and pharynx. The simple reminder to just visualize "chewing," in other words, the production of the vision of eating, in most cases is sufficient to produce immediately a rich flow of saliva, and thereby instant relief from that unpleasant dryness. We may interpret this as a conditioned response. (Flow of saliva caused by the vision of the "chewing method.") It might be interesting to mention the case of psychogenic dryness of the upper part of the pharynx and the mouth. A patient after having gone through a severe mental strain, suffered from tormenting feelings of dryness, and had constantly to moisten her lips with a wet handkerchief. I explained to her the method of "chewing" and asked her to merely visualize it just once in the right way. Instantly she was able to report more moisture in her mouth.

The feeling of dryness after a tonsillectomy can be treated in the same way and with the same success, as experience shows.

Our therapy to relieve these hyperfunctions in singing and speaking consists mainly in the so-called *chewing method*. We explain to the patient the simple function of eating and then have him exhale and produce a sound at the same time, which procedure joined with chewing movements, immediately allows an unimpeded and sometimes even richly resonanced flow of the voice. The method of "playing with the breath" and the "chewing method" has been given and demonstrated by Froeschels (detailed description by D. Weiss[1]). The chewing method is the successor of "playing with the breath," which had already aimed at restoring the entire vocal and speech mechanism.

The aim of both methods is not an uncontrolled relaxation of the whole system, but, on the contrary, an optimum of tension. The method of "playing with the breath" as well as that of the "chewing method" is a rational one, which does not have to be drilled, but only to be conceived by the mind. "Playing with the breath" has to be explained to the patient as simply an acoustically noticeable

[1]Reports about Speech- and Voice Therapy, (Mitteilungen über Sprach-und Stimmheilkunde), Vol. 1, Nr. 2.

form of exhalation, and the inarticulate scream of the primitive man (surprise, jubilation, sigh) should be mentioned. Then we make the patient "exhale audibly" (that means to produce voice) and at the same time we have him gently move his lower jaw, lips and tongue, as if he would just play with his breath. In order to give up all former exaggerations, the patient has to give up, at least for the time being, every *consideration* of exact articulation. He is supposed to "play *with his sounding* breath." These theoretical and practical explanations are followed by "breath-playing" exercises, which have but one aim: to influence the patient's general attitude while he is singing or speaking.

The chewing method is still a simpler method. We just explain that it is indeed possible to sing, speak, and eat at the same time, because eating and speaking have many movements and adjustments in common.[2] This vision, comprising two different functions of the body, in most cases suffices to avoid waste of breath and every kind of hyperfunction.

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[2]Froeschels and Jellinek. Practice of Voice and Speech Therapy. Expression Company, Boston, Mass., 1940.

ANNOTATED BIBLIOGRAPHY ON CORRECTION OF SPEECH DEFECTS

[*Continued from page 160*]

Coggins, B., and Kent, R. *Reading and Speech.* Sierra Educational News, (January, 1938), 34, 35–8.

The two fields are considered together by a teacher from each. The reading work is based on leading the pupil to see what he needs, and preparing him for what he reads by teaching meanings and pronunciations for words he is going to come across in his reading for pleasure. Finger-tracing is a part of this work.

The emphasis in speech work is that the primary steps must be psychological in nature—a procedure "authoritatively patient."—to sell the idea of self-improvement. The authors believe that co-operation with fellow teachers in concentrated and consistent directions will help more to correct speech than an attempt to have only the parent co-operation with the speech teacher.

Routh, R. A. *Remedial Speech Work in the Indiana State Teacher College Laboratory School,* 1935–1936. Teachers College Journal, (March, 1937), 8, 33–40.

The primary and elementary school pupils of the Laboratory School who needed remedial speech treatment were divided into two groups. They were divided more or less homogeneous in age and type of defect. The greater part of this monograph is made up of case summaries of the work with these pupils.

A COMPARATIVE STUDY OF CERTAIN PHYSICAL ABILITIES OF CHILDREN WITH SPEECH DEFECTS AND CHILDREN WITH NORMAL SPEECH

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It has been noted that in play activities and classes in rhythmic drills children with speech defects appeared to have less adequate large muscle co-ordinations than children whose speech was normal.

This observation was not entirely new, inasmuch as the literature of speech correction contains frequent references to certain types of asynergic muscle movement in speech defectives, especially in those who stutter. In the case of the latter group the manifestation of the asynergy referred to is usually observed during speech and may involve muscles other than those used in phonation and articulation. R. Y. Herren[1], in a study relative to the effect of stuttering on voluntary movement concludes:

"During stuttering not only is the speech mechanism proper blocked but also such extra-speech structures as the hands and feet."

John M. Fletcher[2] reported similar findings on a group of stutterers.

Blackburn[3], in a study of the voluntary rhythmical movements of the diaphragm, tongue, lips, and jaw found that stutterers were inferior to normal speakers. In his report of these findings he stated, however, that he found no significant difference between stutterers and normal speakers in the performance of voluntary rhythmical movements other than those directly related to speech.

Seth[4] performed experiments very similar to those used by Blackburn. He concluded that in movements of the jaw, lips, and breathing mechanism stutterers tend to show a higher degree of variability than do the normal speakers, and that his results were comparable to those of Blackburn with the exception that he found

[1]Herren, R. Y. *The Effect of Stuttering on Voluntary Movement.* Jour. of Exper. Psychol., 1931, 14, 289–297.

[2]Fletcher, John M. *An Experimental Study of Stuttering.* Am. Jour. of Psychol., 1914, 25, 201–255.

[3]Blackburn, B. *Voluntary Movements of the Organs of Speech in Stutterers and Non-Stutterers.* Psych. Monog., 41, 4, 1931, p. 1.

[4]Seth, G. *An Experimental Study of the Control of the Mechanism of Speech, and in Particular of that of Respiration in Stuttering Subjects.* Brit. J. Psychol., 24, 1934, 375–388.

less difference between the movements of the lips and jaws in stutterers and non-stutterers.

The observation of an apparent lack of large muscle co-ordination in speech defectives, has led to the employment of various kinds of physical activities and tests in connection with speech diagnostic and retraining programs. For example, West, Kennedy and Carr[5] have outlined the use of such exercises as jumping over a candle stick while reciting, "Jack be nimble," et cetera, walking speech ladders and rhythmically repeating nonsense syllables, and clapping while saying jingles. Twitmyer and Nathanson[6] include a series of calisthenics involving exercises of the head, arms, legs, trunk, and feet, in their manual of speech correction. Many other references of a similar nature can be found in American and European literature.

Certain motor co-ordination tests such as, "walking a straight line; extending arms above head and dropping them suddenly; beginning with hands resting on knees as one sits in a chair, alternately touching nose with forefinger of each hand; standing first on one leg and then on the other, with eyes closed; skipping; and standing tip-toe for five seconds," have been suggested for use in the diagnosis of speech defects.[7] Although the above tests were presented without diagnostic interpretation, they indicate an implied relationship between speech defects and large muscle co-ordinations.

Several studies of the large muscle movements of stutterers have been made by investigators interested in the theory of laterality in relation to stuttering. Their findings are not closely enough related to the present investigation to require their review here. Especial attention is called, however, to a paper by Grenafore Westphal,[8] who studied stutterers in the performance of certain motor tests and came to the following conclusions:

> " . . . the non-stutterers are heavier, (in weight) are stronger with right and left hand, and have better eye-hand co-ordination in all of the functions. . . .
>
> "In no instance have the differences between the scores made by stutterers and those made by non-stutterers been reliable. This does not contravene the fact that there may be differences so small that large numbers of cases will be needed to substantiate the findings of real statistical differences. . . .
>
> "If the implications of this study are accepted as tending to show no measureable difference between stutterers and non-stutterers in functions of motor ability, the re-educational

[5]West, Kennedy and Carr. *The Rehabilitation of Speech.* New York: Harper and Brothers, 1937, pp. 310–311.

[6]Twitmyer and Nathanson. *Correction of Defective Speech.* Philadelphia: P. Blakiston's Son and Co., 1932, pp. 37–42.

[7]Van Riper, C. A. *Speech Correction.* New York: Prentice-Hall, 1939, p. 148.

[8]Westphal, Grenafore. *An Experimental Study of Certain Motor Abilities of Stutterers.* Child Dev., 1933, 4, 214–221.

> therapy for stuttering will probably be advanced by directing attention to some other more reliable etiological factors which may lead to a better understanding of the problem."

Acceptance of this interpretation thus presents a challenge to principles which have been more or less accepted by many speech correctionists.

The foregoing scattered references have been cited because they are indicative of our lack of definite information on the physical abilities of persons who have speech defects, although the implication of a relationship between speech and physical abilities is clearly present.

If we accept the implication as containing a nugget of empirical truth it logically follows that a test which can demonstrate the type and amount of variation in large muscle co-ordinations, if there actually is a variation, between individuals with speech defects and individuals with normal speech, would have value in diagnosis. Furthermore, for those individuals who exhibited a deficiency in motor abilities, a definite type of physical education program might be organized as a part of the plan for speech and physical rehabilitation. This paper concerns an attempt to use such a test in the study of the physical abilities of a group of 90 speech defectives ranging in age from 9 through 18 years.

Statement of the Problem

The object of this study is threefold:

(1) to determine whether there is a characteristic difference in certain physical abilities between children with normal speech and those who stutter or have an articulatory disorder.

(2) to determine whether there is a characteristic difference in certain physical abilities between children who stutter and children who have defective articulation.

(3) to determine on the basis of the findings, whether a specific type of physical education program is indicated for speech defective children.

Procedure

Selection of Subjects

The subjects, 180 of whom were tested individually, were children who came to the University of Michigan Speech Clinic or were examined during speech surveys at several schools in the Lower Peninsula of Michigan[9]. Ninety of these children whose speech defects could be classified under the two general headings of stuttering and articulatory disorders were selected for analysis. All children were excluded whose defective speech could be attributed to organic defects (cleft palate, severe dental maloclusions, defective hearing,

[9]The towns in which surveys were carried on were: Hemlock, Chesaning, Roseville, Dundee, Saginaw, River Rouge, and Ecorse.

paralysis, etc.) and all who were below 9 years and above 18 years of age because the tests used were not valid for children who were outside of these age limits.

Tests

Three tests were used in the present study, namely, the Brace Motor Ability Tests, Nielsen and Cozens' Jump and Reach Test, and the writer's Eye-Hand Co-ordination Test.

Brace Motor Ability Test—The Brace Motor Ability Test is intended for use as a measure of general motor ability.[10] The term, *motor ability*, is used "to designate those muscular reactions resulting in manipulating the body."[11] The test is divided into Forms M and N which are approximately equivalent; each part contains ten tests.

The correlation for Form M and Form N is r=.61, P. E. ±.02.[12]

Form M[13] was used in this investigation. A description of each part of the test follows:

BRACE MOTOR ABILITY TESTS

TEST 1

Walk in a straight line, placing the heel of one foot in front of and against the toe of the other feet. Start with the left foot. Take 10 steps in all, 5 with each foot. Eyes open.

Failure—1. Losing the balance and stepping out of line.
2. Not walking in a straight line.
3. Not placing heel to toe.

TEST 2

Stand Jump into the air and clap both feet together once, and land with the feet apart (any distance).

Failure—1. Landing with the feet touching each other.
2. Failure to clap the feet in the air once.

TEST 3

Lie flat on the back on the floor. Fold the arms across the chest. Raise the trunk to a sitting position. Do not raise the feet above the floor, or unfold the arms.

Failure—1. Raising the feet above the floor. (This does not include sliding the feet, which is permissible.)
2. Unfolding the arms.
3. Failure to sit up.

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[11]Brace, D. K., Op. Cit., p. xv, Preface.

[12]Brace, D. K., Op. Cit., p. 51.

[13]Brace, D. K., Op. Cit., pp. 105–114.

[10]Brace, D. K. *Measuring Motor Ability.* A. S. Barnes and Co., New York, 1927, p. 93.

TEST 4

Stand. Fold the arms behind the back. Kneel onto both knees. Get up without losing the balance or moving the feet about.

Failure—1. Losing the balance either going down or getting up.
2. Moving the feet after standing up.
3. Unfolding the arms.

TEST 5

Take a front leaning rest position, i. e., place the hands on the floor, arms straight, extend the feet back along the floor until the body is straight (in an inclined position to the floor). Bend the arms, touching the chest to the floor, and push up again to straight arms. Do this 3 times in succession. Do not touch the floor with the legs or waist.

Failure—1. Failure to push up 3 times.
2. Failure to touch the chest to the floor each time.
3. Resting the knees, thighs, or waist on the floor at at any time.

TEST 6

Squat on the heels with feet together and knees out, and hands between the knees with fingers touching the floor. Spring up onto both heels, with legs straight and toes up, and swinging both arms out at the side level with the floor. The feet should then be about 18 inches apart. Head up. Repeat this exercise three times (in all) rhythmically.

Failure—1. Failure to get the arms and legs in position.
2. Failure to do it three times in succession without stopping.

TEST 7

Stand with feet together. Jump into the air and make a full turn to the left, landing on the same spot. Do not lose the balance or move the feet after they strike the floor.

Failure—1. Failure to get all the way around.
2. Moving the feet after they strike the floor.

TEST 8

Jump into the air and clap the feet together twice and land with the feet apart any distance.

Failure—1. Failure to clap the feet together twice.
2. Landing with the feet touching each other.

TEST 9

Stand on the right foot. Grasp the left foot behind the right knee. Bend and touch the left knee to the floor, and stand up without touching any other part of the body to the floor, or losing the balance.

Failure—1. Touching the floor with any part of the body except the left knee.
2. Failure to touch properly and stand with right leg straight, and without losing the balance.

TEST 10

Hold the toes of either foot in the opposite hand. Jump up and jump the free foot over the foot that is held, without letting go.

Failure—1. Letting go of the foot that is held.
2. Failure to jump through the loop made by holding the foot.

A brief review of what each of the above ten tests measures will aid in indicating the general scope of the Brace Motor Ability Tests. Brace[14] has suggested that:

Test	1	primarily tests	balance.
Test	2	" "	agility and balance.
Test	3	" "	control.
Test	4	" "	balance.
Test	5	" "	strength.
Test	6	" "	agility.
Test	7	" "	agility and balance.
Test	8	" "	agility and balance.
Test	9	" "	strength and control.
Test	10	" "	agility.

The tests have been arranged in the order of succeeding difficulty of performance.

The score for the Brace Test is obtained by counting the total number of tests passed. Because only the first 10 tests are used in this study, the score is doubled so that comparisons can be made with the Brace Means which are based on 20 tests, or Forms M and N. Two trials are given on each test and if the subject is unable to pass a test on the first trial, but is able to pass on the second, the test is considered passed. Failures on the first followed by failures on the second trial of the same tests show a high correlation, i. e., r. = 90.[15]

Jump and Reach Test—Nielsen and Cozens' Jump and Reach Test is fundamentally an achievement test involving jumping and pushing. It is a test in which the subject can expend a maximal amount of effort, and it was chosen as one of the three tests of this study for that reason (None of the Brace Tests demand the utmost exertion of energy, with a possible exception of tests No. 3 and No. 5.)

Dr. C. H. McCloy[16] has described the jump in the following manner:

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[14]Brace, D. K., Op. Cit., p. 6.

[15]Brace, D. K., Op. Cit., p. 96.

[16]McCloy, C. H. *Tests and Measurements in Physical Education.* F. S. Crofts and Co., 1939, New York, p. 57.

> "It measures the ability to develop power. If the work is done slowly, the body does not leave the ground. If it is done with sufficient rapidity to cause the momentum of the body to continue the upward motion sufficiently to raise the feet from the floor, and to project the body still farther upward, the body then 'jumps' from the floor. . . . this event demonstrates maximum (or nearly maximum) muscle contraction over a minimum of time."

Thus the Jump and Reach Test provides an achievement test in which the child may attempt to use his utmost power and through the use of an achievement scale, his score can be compared with an average or mean.

A description of the test is as follows:

> "The subject stands facing the wall, feet together, toes touching wall, and toes and heels touching floor. With both hands held together he reaches as high as possible (heels kept on floor) and makes a mark with a piece of chalk. Contestant then stands with side to wall. While swinging both arms vigorously a jump is made on the wall with the chalk held in one hand. The distance between the two marks is the individual's record. Each subject is given three trials in succession and the best of the three trials is the subject's record. Measurement is made to the nearest half inch."[17]

The subjects for this test are classified in accordance with the classification chart which was developed in the Oakland (California) Public Schools. Nielsen and Cozens[18] have established the validity of the classification scheme through a research in which was found a correlation of .983 between the plan and another one set up scientifically. Height, age, and weight are considered in classifying the children.

Eye-Hand Co-ordination Test—The Eye-Hand Co-ordination Test is intended for use in the measurement of ability to co-ordinate alternate hand movements with a moving object external to the body.

A description of the test is as follows:

The subject bounces a rubber ball, 19½ inches in circumference, using alternate hands as rapidly as possible for 20 seconds. The subject stands with knees unbent and feet not more than two feet apart at the outer edge of a circle 3 feet in diameter. He directs the ball into the circle and continues to bounce the ball at least knee high. The score consists of the number of bounces that fall within the circle or on the ½ inch line of the circle. Two consecutive trials are given. If the subject misses before the 20 second time limit has lapsed, the number of bounces he has made up to that time is the

[17]Nielsen and Cozens. *Achievement Scales in Physical Education Activities.* California State Department of Education, Sacramento, 1934, p. 21.

[18]Nielsen and Cozens, Op. Cit., p. 5.

score for that trial. The better score of the two trials is the subject's score for the test. Tapping the ball twice consecutively with the same hand or bouncing it outside of the limits of the circle constitutes a miss.

330 children who did not have defective speech were given the test and their mean scores by age groups were compared with scores made by the speech defective children.

Method Used in Analysis of Data

The data obtained in all three tests, namely, the Brace Motor Ability Test, Nielsen and Cozens' Jump and Reach Test, and the writer's Eye-Hand Co-ordination Test, was analyzed as follows:

(1) The deviation of the score of each subject from the mean (for children without speech defects) was obtained by subtracting the subject's score from this mean. The sum of the deviations was divided by the number of subjects; the quotient represents the Mean Deviation.[19] In computing the Mean Deviation, the separate deviations were added with regard taken of positive and negative numbers, thus the calculations resulted in a mean deviation which was either above or below the mean.

(2) The mean deviations of the stutterers was compared with the mean deviations of the articulatory subjects.

(3) The deviations from the mean for children without speech defects was calculated by age groups, and the deviations of the articulatory subjects and the stutterers were compared. This analysis by age groups was made in order to ascertain whether there was any characteristic deviation from the norms of the three tests at certain age levels which would materially affect the Mean Deviation and the percentage of subjects above and below the mean. This analysis was supplemental to, and a check on, the analysis made in part (2).

(4) Standard Deviation and possible error were calculated in each of the three tests.

Analysis of Data

Brace Motor Abilities Test—Tables I and II present the individual deviations and deviations by age groups from the mean, the mean deviations, and the standard deviations of the stutterers and articulatory subjects in the Brace Motor Ability Test.

Ten of the stutterers scored above the mean and the remaining twenty-four scored below the mean. Interpreted in terms of pertages, 29.41% of the stutterers scored above the mean and 70.59% of them scored below. The mean deviation was —1.56. This indicates that the stutterers scored on an average of about 1½ tests per subject below the mean in the Brace Motor Ability Test. As a group, therefore, they fall below children who do not have speech defects in the motor abilities tested by this test.

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[19] $\text{M.D.} = \frac{\Sigma \Delta}{N}$

Twenty articulatory subjects, or 35.71%, scored above the mean, and thirty-six, or 64.29%, scored below the mean in the Brace Motor Ability Tests. In other words, almost two-thirds of the group were inferior to children without speech defects in these motor abilities. The Mean Deviation was —1.48. Thus, the articulatory subjects scored almost 1½ tests per subject below the Brace mean.

TABLE I

BRACE MOTOR ABILITIES

STUTTERERS

Subj.	Age Group	Score	Brace Means	Individual Deviation	Age-Group Means	Age-Group Deviation	S. D.
1	18	18	14.97	3.03	12.00	—2.97	
2		6		—8.97			
3	17	10	12.63	—2.63	14.00	1.37	
4		18		5.37			
5	15	10	13.13	—3.13	12.00	—1.13	
6		12		—1.13			
7		14		.87			
8	13	12	11.91	.09	12.00	.09	
9		10		—1.91			
10		18		6.09			
11		10		—1.91			
12		6		—5.91			
13		16		4.09			
14	12	14	11.85	2.15	10.50	—1.35	
15		6		—5.85			
16		8		—3.85			
17		16		4.15			
18		10		—1.85			
19		8		—3.85			
20		12		.15			
21		10		—1.85			
22	11	6	10.97	—4.97	6.67	—4.30	
23		4		—6.97			
24		10		— .97			
25	10	6	8.84	—2.84	7.00	—1.84	
26		2		—6.84			
27		8		— .84			
28		6		—2.84			
29		8		— .84			
30		12		3.16			
31	9	4	7.56	—3.56	4.50	—3.06	
32		4		—3.56			
33		4		—3.56			
34		6		—1.56			3.9± .45
			Mean Deviation	—1.56			

Comparing the percentages and the mean deviations of the stutterers and the articulatory subjects, it is seen that there is very little difference between the two groups. In addition, the Standard Deviation of the two groups is almost the same, i. e., 3.93 ± .35 for the articulatory subjects, and 3.9 ± .45 for the stutterers.

TABLE II

BRACE MOTOR ABILITIES

ARTICULATORY SUBJECTS

Subj.	Age Gr up	Score	Brace Means	Individual Deviation	Age-Group Means	Age-Group Deviation	S. D.
35	18	14	14.97	— .97	15.00	.03	
36		16		1 03			
37	17	18	12.63	5.37	14.67	2.04	
38		10		—2.63			
39		16		3.37			
40	16	12	14.36	—2.36	14.36	—2.36	
41	15	8	13.13	—5.13	9.00	—4.13	
42		10		—3.13			
43	14	12	12.74	— .74	8.00	—4.74	
44		4		—8.74			
45		8		—4.74			
46	13	8	11.91	—3.91	8.40	—3.51	
47		12		.09			
48		12		.09			
49		4		—7.91			
50		6		—5.91			
51	12	6	11.85	—5.85	9.25	—2.60	
52		8		—3.85			
53		8		—3.85			
54		6		—5.85			
55		4		—7.85			
56		14		2.15			
52		10		—1.85			
58		18		6 15			
59	11	12	10.97	1.03	9.60	—1.37	
60		4		—6.97			
61		12		—1.03			
62		10		— .97			
63		10		— .97			
64	10	10	8.84	1.16	8.40	— .44	
65		8		— .84			
66		10		1.16			
67		4		—4.84			
68		0		—8.84			
69		16		7.16			
70		14		5.16			
71		6		—2.84			
72		10		1.16			
73		6		—2.84			
74	9	6	7.56	—1.56	6.71	— .85	
75		10		2.44			
76		4		—3.56			
77		6		—1.56			
78		8		.44			
79		6		—1.56			
80		6		—1.56			
81		4		—3.56			
82		4		—3.56			
83		8		.44			
84		10		2.44			
85		4		—3.56			
86		4		—3.56			
87		6		—1.56			
88		8		.44			
89		10		2.44			
90		10		2.44			3.93 ± .35
			Mean Deviation	—1.48			

Six of the eight, or 75% of the stutterers' age groups scored below the Brace Means, and eight of the ten, or 80% of the articulatory groups were below the Brace Means.

From this data it is evident that both the stutterers and the articulatory subjects were inferior to children without speech defects at almost all of the age levels in large muscle activities measured by the Brace Motor Ability Test.

Jump and Reach Test—Tables III and IV show the individual and age-group deviations from the means, the mean deviations, and standard deviation of the results for both stutterers and articulatory subjects.

TABLE III

JUMP AND REACH

STUTTERERS

Subj.	Age Group	Score	Calif. Means	Individual Deviation	Age-Group Means	Age-Group Deviation	S. D.
1	18	94	50	44	54.50	4.50	
2		24		—26			
3	17	37		—13	51.00	1.00	
4		67		17			
5	15	70		20	49.67	— .33	
6		32		—18			
7		45		— 5			
8	13	52		2	53.33	3.33	
9		37		—13			
10		67		17			
11		46		— 4			
12		36		—14			
13		82		32			
14	12	79		29	44.12	—5.88	
15		40		—10			
16		31		—19			
17		40		—10			
18		47		— 3			
19		52		2			
20		27		—23			
21		37		—13			
22	11	44		— 6	38.00	—12.00	
23		32		—18			
24		38		—18			
25	10	50		0	44.83	— 5.17	
26		25		—25			
27		67		17			
28		30		—20			
29		41		— 9			
30		56		6			
31	9	47		— 3	30.50	—19.50	
32		8		—42			
33		23		—27			
34		44		— 6			18.88±2.19

Mean Deviation —4.50

TABLE IV

JUMP AND REACH

ARTICULATORY SUBJECTS

Subj.	Age Group	Score	Calif. Means	Individual Deviation	Age-Group Means	Age-Group Deviation	S. D.
35	18	43	50	— 7	49.00	— 1.00	
36		55		5			
37	17	73		23	63.00	13.00	
38		52		2			
39		64		14			
40	16	46		— 4	46.00	— 4.00	
41	15	34		—16	45.00	— 5.00	
42		56		6			
43	14	43		— 7	34.60	—15.40	
44		24		—26			
45		37		—13			
46	13	31		—19	44.60	— 5.40	
47		51		1			
48		41		— 9			
49		63		13			
50		37		—13			
51	12	45		— 5	50.00	0.00	
52		60		10			
53		41		— 9			
54		51		1			
55		45		— 5			
56		63		13			
57		47		— 3			
58		49		— 1			
59	11	40		—10	45.40	— 4.60	
60		45		— 5			
61		50		0			
62		31		—19			
63		61		11			
64	10	48		— 2	45.60	— 4.40	
65		50		0			
66		56		6			
67		53		3			
68		29		—21			
69		50		0			
70		53		3			
71		41		— 9			
72		56		6			
73		26		—30			
74	9	38		—12	42.88	— 7.12	
75		68		18			
76		22		—28			
77		41		— 9			
78		50		0			
79		44		— 6			
80		37		—13			
81		38		—12			
82		50		0			
83		33		—17			
84		65		15			
85		41		— 9			
86		38		—12			
87		41		— 9			
88		41		— 9			
89		47		— 3			
90		35		—15			12.05±1.09
				Mean Deviation	— 4.23		

Ten stutterers, or 29.41%, scored above, and twenty-three, or 67.65%, scored below the mean, and one, or 2.94%, scored on the mean. The mean deviation for the group was —4.50. It is evident from these figures that the stutterers were inferior to children without speech defects in this achievement test.

Seventeen, or 30.36% of the articulatory subjects scored above the mean, while thirty-four, or 60.72%, scored below, and five, or 8.93%, scored exactly on the mean. The mean deviation for this group was —4.23 points; this means that the average for each articulatory subject in the Jump and Reach Test was about 4¼ points below the average for children without speech defects.

In comparing the two speech defective groups it is evident that the stutterers had a slightly greater mean deviation than the articulatory subjects. The deviation for the former was —4.50 points and for the latter it was —4.23 points. The standard deviation from the mean was also larger for the stutterers than for the articulatory subjects, i. e., 18.88 ± 2.19, as compared with 12.05 ± 1.09. Continuing the comparison of the two speech defective groups through an analysis of the age-group means, we note that the articulatory group scored higher at five age levels, namely, the 9, 10, 11, 12, and 17 year levels. They scored lower than the stutterers at the 13, 15, and 18 year levels. No comparison can be made at the 14 and 16 year age levels because there were no stutterers in these age groups.

A general conclusion from this data is that both speech defective groups were inferior in the Jump and Reach Test (which measures ability to develop power) to children who do not have speech defects. The articulatory subjects were slightly better in this achievement test than the stutterers.

Eye-Hand Co-ordination Test—Tables V and VI show the individual and age-group deviations from the means, the mean deviations, and the standard deviations for the stutterers and articulatory subjects in the Eye-Hand Co-ordination Test.

Eleven, or 32.35%, of the stutterers scored above the mean, while twenty-three, or 67.65%, scored below the mean in the Eye-Hand Co-ordination Test. The mean deviation was —4.44. These figures indicate that about one-third of the stutterers were better than the average for children without defective speech, and that about two-thirds were not so good as the average in this test. The mean deviation shows that the average score for each child in the group was about 4½ points less than the average score made in this test by children without speech defects.

Eighteen, or 32.14%, of the articulatory subjects scored above, whereas, thirty-eight, or 67.86%, scored below the mean in this test. The mean deviation was —6.55. This date is indicative of the fact that slightly more than two-thirds of the group scored below, and a little less than one-third, scored above the mean in the Eye-Hand Co-ordination Test. Also, the average score per child was about 6½ points lower than the average for children who do not have defective speech.

A comparison of the scores of the two speech defective groups shows the stutterers to be better than the articulatory subjects in this co-ordination test. The mean deviation for the stutterers was —4.45 and for the articulatory subjects it was —6.55. The standard deviation for the stutterers was 10.3 ± 1.19 and for the articulatory group it was 13.4 ± 1.21. These figures show that the stutterers were superior to the articulatory subjects both individually and as a group in the Eye-Hand Co-ordination involved in this test.

An analysis of the age-group means shows that all of the groups of stutterers and articulatory subjects scored below the means. The stutterers attained higher scores than the articulatory subjects in all but the 9 and 12 year age levels. No comparison can be made in the 14 and 16 year age groups because there were no stutterers at these age levels. No particular age group deviated so greatly from the mean as to cause an appreciable change in the Mean Deviation.

TABLE V

EYE-HAND COORDINATION

STUTTERERS

Subj.	Age Group	Score	Means	Individual Deviation	Age-Group Means	Age-Group Deviation	S. D.
1	18	38	43.20	— 5.20	39.00	—4.20	
2		40		— 3.20			
3	17	28	40.37	—12.37	38.00	—2.37	
4		48		7.63			
5	15	30	34.06	— 4.06	25.33	—8.73	
6		32		— 2.06			
7		14		—20.06			
8	13	31	35.38	— 4.38	29.67	—5.71	
9		31		— 4.38			
10		34		— 1.38			
11		36		.62			
12		8		—27.38			
13		38		2.62			
14	12	35	29.77	5.23	27.87	—1.90	
15		27		— 2.77			
16		25		— 4.77			
17		23		— 6.77			
18		17		—12.77			
19		34		4.23			
20		26		— 3.77			
21		36		6.23			
22	11	7	26.50	—19.50	21.33	—5.17	
23		36		9.50			
24		21		— 5.50			
25	10	18	25.04	— 7.04	23.17	—1.87	
26		6		—19.04			
27		35		9.96			
28		29		3.96			
29		28		2.96			
30		23		— 2.04			
31	9	32	24.09	7.91	15.25	—8.84	
32		11		—13.09			
33		3		—21.09			
34		15		— 9.09			10.3±1.19

Mean Deviation — 4.44

TABLE VI

EYE-HAND COORDINATION

ARTICULATORY SUBJECTS

Subj.	Age Group	Score	Means	Individual Deviation	Age-Group Means	Age-Group Deviation	S. D.
35	18	38	43.20	— 5.20	38.00	— 5.20	
36		38		— 5.20			
37	17	36	40.37	— 4.37	36.67	— 3.70	
38		35		— 5.37			
39		39		— 1.37			
40	16	27	39.63	—12.63	27.00	—12.63	
41	15	12	34.06	—22.06	23.00	—11.06	
42		34		— .06			
43	14	37	33.26	3.74	21.23	—11.93	
44		2		—31.26			
45		25		— 8.26			
46	13	31	35.38	— 4.38	27.80	— 7.58	
47		34		— 1.38			
48		35		— .38			
49		36		.62			
50		3		—32.38			
51	12	35	29.77	5.23	28.88	— .89	
52		36		6.23			
53		21		— 8.77			
54		14		—15.77			
55		35		5.23			
56		39		9.23			
57		15		—14.77			
58		36		6.23			
59	11	30	26.50	3.50	20.40	— 6.10	
60		4		—22.50			
61		36		9.50			
62		12		—14.50			
63		20		— 6.50			
64	10	31	25.04	5.96	17.70	— 7.34	
65		24		— 1.04			
66		19		— 7.04			
67		10		—15.04			
68		3		—22.04			
69		36		10.96			
70		38		12.96			
71		6		—19.04			
72		4		—21.04			
73		6		—19.04			
74	9	3	24.09	—21.09	16.86	— 7.23	
75		34		9.91			
76		2		—22.09			
77		8		—16.09			
78		34		9.91			
79		7		—17.09			
80		32		7.91			
81		2		—22.09			
82		13		—11.09			
83		5		—19.09			
84		16		— 8.09			
85		30		5.91			
86		18		— 6.09			
87		8		—16.09			
88		32		7.91			
89		35		10.91			
90		6		—18.09			13.4±1.21

Mean Deviation — 6.55

Both the stutterers and articulatory subjects were inferior to children without speech defects in the Eye-Hand Co-ordination Test.

Summary and Conclusions

The problem of the present investigation has been to determine whether there is a characteristic difference in certain physical abilities between children with speech defects and children with normal speech, to determine whether there is a difference between children who stutter and children with defective articulation in the same physical abilities, and to suggest, if possible, a definite type of physical education program for children with defective speech.

Three tests were used, namely, the Brace Motor Ability Test, Nielsen and Cozens' Jump and Reach Test, and the writer's Eye-Hand Co-ordination Test.

The tests were administered individually to 180 children, 90 of whom were retained for analysis.

The 90 children who were retained for critical analysis were distinguishable by two types of speech defects, namely, stuttering and defective articulation. The age range of the group was from 9 through 18 years.

The data was analyzed as follows: (a) Calculations were made to determine whether the subjects scored above or below the mean score of children without speech defects, and the Mean Deviation was determined for these scores by dividing the sum of the deviations by the number of subjects. (b) The mean deviations of the stutterers were compared with the mean deviations of the articulatory subjects. (c) The deviations from the mean for children with speech defects were calculated by age groups and the deviations the articularly subjects and the stutterers were compared. (d) Standard Deviation and statistical reliability were calculated.

The data thus collected and analyzed has been interpreted as follows:

(1) The children with speech defects were inferior as a group to children with normal speech in the large muscle abilities which are included in the Brace Motor Ability Test, the Nielsen and Cozens' Jump and Reach, Test and the writer's Eye-Hand Co-ordination Test. The inferiority of the children with speech defects in these tests was not characterized by failure in any specific type of physical ability. In the Brace Test the negative Mean Deviation resulted from the inability of 66⅔% of the subjects to pass the tests of increasing difficulty. These tests contained combinations of elements which most of the subjects had already performed in the simpler tests of the series. Inferiority in the Jump and Reach and Eye-Hand Co-ordination tests was caused by deficiencies which were characteristic of the individual performers rather than the entire group.

The elements of rhythm, co-ordination, and strength were necessary for the correct performance of all these tests. From the results of this study it can be concluded that approximately two-

thirds of the speech defective children were inferior to children with normal speech in these physical abilities.

(2) There was very little difference between the performance of the stutterers and the articulatory subjects in the Brace Motor Ability Test. The articulatory subjects were slightly better than the stutterers in Nielsen and Cozens' Jump and Reach Test. In the writer's Eye-Hand Co-ordination Test, the stutterers were superior to the articulatory subjects.

(3) The data did not yield any information about a specific type of physical education program for children with speech defects, as is evident from the statement of conclusion (1). It was apparent, however, that a majority of the children studied in this investigation would profit from a general program of physical education. That is, there appeared to be retardation in general motor abilities involving balance, agility, control, strength, and movements which involved combinations of these elements in the Brace Motor Ability Test; there was evidence of weakness in these children in the Jump and Reach Test which involved an utmost exertion of energy; and there was an indication of inferior eye-hand co-ordination among the speech defective subjects who were tested in this investigation.

(4) Although no *specific type* of physical retraining program can be suggested which will answer the needs of *all* speech defective children, yet the tests used in this study are sufficiently discriminating to indicate the types of physical abilities in which a child excels or is inferior. For this reason these tests can be profitably utilized in the diagnosis of the physical abilities of children with speech defects. This battery of tests has been used at the University of Michigan Speech Clinic as one of the methods of gathering specific information about a child, and through this diagnostic aid, physical retraining programs have been set up to meet individual needs.

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COMMITTEE ON NATIONAL DEFENSE, AMERICAN SPEECH CORRECTION ASSOCIATION

Submitted by
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During the annual convention of the A. S. C. A. held at Pennsylvania State College, September, 1940, the Association passed a resolution advising Governmental Agencies that the A. C. S. A. endorses the National Emergency Program. The resolution passed also made available the services and facilities of the A. S. C. A. to Governmental Agencies. During the last week of December, 1940, a temporary Emergency Committee of the A. S. C. A. composed of Dr. Herbert Koepp-Baker (in absentia), the Committee on Education, Professor Harry Heltman, Dr. D. W. Morris, and the President of the Association arranged for consultations in Washington with various federal officials. Consultations were held at the Army Surgeon General's office, the Navy Surgeon General's office, the federal office of the National Health and Fitness Programs (Paul McNutt), and the headquarters for the National Roster of Scientific and Specialized Personnel. Reports of these conferences were submitted to the President of the Association. As a result of these reports the President of the Association appointed a special Committee of Neuro-psychiatrists to construct a report for the Army Surgeon General's Office. The personnel of this Committee included Drs. Meyer Solomon, Ira S. Wile, and Smiley Blanton. The Chairman of the Committee on Education (M. D. Steer) and the President of the Association served as an Advisory Board and reviewed the report before it was sent to Washington. The response to this report indicated that the Surgeon General of the Army would use the proposals of the A. S. C. A. should a speech therapy program be envoked. At the present time the report is on file in the office of the Surgeon General of the Army. Another temporary committee made arrangements to list the personnel of the A. S. C. A. in the national headquarters of the Roster of Scientific and Specialized Personnel. The Technical Check List which was included in this questionnaire sent to all of the membership of the A. S. C. A. was the result of the co-operative effort of Dr. Sara Stinchfield Hawk (out-going president), Professor Robbins (new president), and Dr. M. D. Steer, Chairman, Committee on Education. The membership list for the National Roster was submitted by Dr. D. W. Morris, Secretary, A. S. C. A. As a result of the conference with Paul McNutt, Chairman, National Health and Fitness Program, Dr. D. W. Morris and Professor Harry Heltman were charged with the responsibility of constructing a report for the Office of Mr. McNutt.

In February, 1941, the President of the A. S. C. A. appointed an official committee entitled, Committee on National Defense. The personnel of this Committee includes the following Fellows of the Association: Dr. M. D. Steer, Chairman, Dr. Ira. S. Wile, Dr. Smiley Blanton, Dr. D. W. Morris, Dr. Sara Stinchfield Hawk, Dr. Robert West, Dr. L. E. Travis, Dr. Herbert Koepp-Baker, and the President of the Association. Each member of the Defense Committee was charged with the duty of chairman for various subcommittees. The personnel of the sub-committees was announced on April 5, 1941, by the President of the Association. The sub-committees and their personnel include the following: *Programs for Selective Service and Induction Camps*—Dr. Ira S. Wile, Chairman, Dr. James F. Bender, Dr. C. S. Bluemel; *Programs for Veterans' Bureau and Veterans' Hospitals*—Dr. Smiley Blanton, Chairman, Dr. H. Harlan Bloomer, Dr. Martin F. Palmer, Dr. Sara Stinchfield-Hawk; *National Health and Fitness Programs*—Dr. D. W. Morris, Chairman, Dr. Harlan Bloomer, Dr. Wendell Johnson, Dr. Charles Van Riper; *Emergency and War Bibliography*—Dr. Sara Stinchfield Hawk, Chairman, Dr. Emil Froeschels, Dr. Margaret Hall, Dr. Paul Pfaff; *Special Tests and Measurements*—Dr. Robert West, Chairman, Dr. G. Oscar Russell, Dr. Ollie L. Backus, Dr. Claude E. Kantner, Dr. Merle Ansberry, and Dr. Mildred F. Berry; *Emergency and War Research*—Dr. L. E. Travis, Chairman, Dr. Bryng Bryngelson, Dr. C. T. Simon, Dr. Spencer Brown, Dr. John C. Snidecor; *Standardization of Therapy Methodology*—Dr. Herbert Koepp-Baker, Chairman, Dr. Martin F. Palmer, Dr. Charles R. Strother; *Programs and Proposals* for the *Navy Department*—Dr. M. D. Steer, Chairman, Dr. Robert Milisen, Dr. G. Paul Moore, Professor Harry Heltman.

The personnel of the sub-committees are charged with the responsibility of preparing plans and proposals relating to the various specific areas. The Committee on Selective Service and Induction Camps is charged with the immediate responsibility of estimating the incidence of man-power rejected because of speech disorders in the various states and induction camps of the country. According to Selective Service regulations, provisions have been made for rejection or deferred classification of selectees manifesting stuttering, aphonia, and other handicapping speech defects. This Committee is charged with the responsibility of securing permission from the National Selective Service Headquarters for a survey of all state and local medical boards. The Committee on Veterans' Bureaus and Veterans' Hospitals has been charged with the responsibility of securing permission from the federal government to study all veterans' hospitals relative to the needs for speech therapy and programs which would operate effectively. The Committee on National Health and Fitness has been charged with the responsibility of determining how the A. S. C. A. can best serve the civilian population. This Committee also is charged with the responsibility of considering proposals for speech rehabilitation centers to be used by selectees rejected because of manifected speech disorders. The Committee on War Bibliography is charged with the responsibility of gathering all references pertaining

to speech problems in an emergency and war as they pertain to military and civilian population. The Committee on Tests and Measurements is charged with the responsibility of constructing special tests for speech malingering, differential diagnosis, and surveys. Special measurements for establishing progress in speech rehabilitation are to be analyzed. The Committee on War Research is charged with the responsibility of (1) determining the effect of emergency and war programs upon the present status of speech therapy in private and educational institutions, (2) of establishing investigations leading toward the prediction of speech stability and instability among personnel engaged in military programs, (3) analyzing the limitations of speech defectives in civilian and military emergency activities, (4) the effects of simulated war conditions upon the speech stability of civilian and military personnel. All sub-committees are advised to direct research problems to the chairman of this sub-committee. The chairman of the sub-committee on Research will request various university and hospital clinics to serve as centers for all necessary co-operative clinical and laboratory research problems. The Committee on Standardization of Therapy Methodology is charged with the responsibility of constructing a manual of directions for all therapists engaged in emergency speech therapy programs. General rules of procedure for various defects are to be established and whenever possible, applied by therapists to individual cases. Specifically, this sub-committee is to consider standardization of methodology for rehabilitation of people manifesting aphasia, aphonia, dysphemia (hysterical and mutism), stuttering, etc., dysaudia, and dysarthria. The Committee on Programs for the Navy is charged with the responsibility of determining the needs for speech therapy at naval training stations, naval hospitals, and hospital ships. This Committee is to submit a report to the Office of the Surgeon General of the Navy indicating the training and skills of speech therapists. All problems relating to the areas of the various sub-committees should be directed to the attention of the sub-committee. Personnel of the American Speech Correction Association are urged not to communicate directly with government officials since confusion may limit the possible achievement of the Committee on National Defense of the A. S. C. A.

Current information available to the Chairman of the Committee on National Defense of the A. S. C. A. indicates the following facts: (1) At the date of this communication the Surgeon General of Public Health has not provided for a speech therapy program. (2) The Office of the Surgeon General of the Army has adopted the position that the current army training is for individuals without handicapping speech disorders. (3) Decisions relative to speech disorders manifested by selectees are under the local board physicians and the neuro-psychiatrists at induction stations. According to figures based on a sampling of more than seventeen thousand selectees in the New York City area, approximately one-tenth of one per cent of this sampling has been rejected or placed in a deferred classification because of stuttering. Medical opinion is that the rest of the stutter-

ers have been disqualified because of physical conditions other than stuttering. Recent data (we need more of these cases reported) indicate that known stutterers have been selected for army service in various parts of the country. Evidently, this "training program for the physically fit" does include men with speech disorders. Other national professional organizations have attempted to impose programs upon various military and federal bureaus without success. Our National Defense Committee can adopt any one of many operating philosophies. The philosophy which appears best at the present time is for the A. S. C. A. to adopt the attitude of being a strictly professional society. Our facilities should be made known to all agencies invested with the problem of speech defective personnel. It is proposed that the various sub-committees submit reports to the Association's Committee on National Defense for consideration. These reports will be considered for publication in the *Journal of Speech Disorders* and copies sent to the various government agencies.

FIRST ANNUAL REPORT

On October 8, 1940, President Sara Stinchfield-Hawk sent the following communication to President F. D. Roosevelt, Secretary of War Stimson, Surgeon General of Public Health Parran, Dr. Walter Bingham of the Adjutant General's Office, and Dr. Walter Miles, Chairman of Emergency Committee of the American Psychological Association:

> "At the annual meeting of the American Speech Correction Association at Pennsylvania State College, Sept. 1–4, 1940, the following resolution was offered and the motion for its adoption was unanimous: It concerns the co-operation of our association in the National Defense Program.
>
> WHEREAS, the American Speech Correction Association is the official organization of trained specialists in the field of remediation of speech handicaps and
>
> WHEREAS, it has been established that a great percentage of the population is so handicapped, as was shown in the past war, and
>
> WHEREAS, in the past war an acute problem of placement of these handicapped persons existed, with only a small personnel trained in the handling of such cases, while now a national association exists, with members in all of the leading universities of this country, and in some hospital speech clinics, and
>
> WHEREAS, speech disabilities arising from military service in war constitute numbers of problems in addition to those ordinarily found in the general population, and
>
> WHEREAS, a national emergency exists in which the man power of the nation is being called to serve,

Therefore be it Resolved, by vote of the Fellows of the American Speech Correction Association that the association place its collective and individual services at the disposal of the war department of the United States, endorsing the principle of national defense, and pledging its entire active resources in that manner which shall be of best service to the nation."

Dr. Hawk continued to direct the defense program efforts until January 1, 1941, when Professor Samuel Robbins became the new President of the American Speech Correction Association. The Committee on Education (Chairman, Dr. M. D. Steer) was directed to co-operate in the defense program plans by Dr. Hawk while she was still the President of the Association. The Committee met in Washington, D. C., in December, 1940, during the annual convention of the National Association of Teachers of Speech. While in Washington, D. C., officers of the Association met with the Committee on Education to formulate a temporary policy for the Association's Defense Program. Discussions were held with Federal Civilian and Military authorities. These conferences were with the following people: J. C. O'Brien, Administrator of the National Roster of Professional and Scientific Personnel; Lieut. Col. J. F. Lieberman, Assistant, Surgeon General of the War Department; Lieut. Commander C. M. Louttit, Office of the Navy Surgeon General; and Paul McNutt, Chairman, National Health and Fitness Program, and Director, Federal Security Bureau. These conferences were reported to President Hawk and to the new President, Professor Robbins.

The following is a monthly log from January 1, 1941, until November 10, 1941, of the defense program activities of the American Speech Correction Association. It should be noted that the activities were under the direction of the Committee on Education until the Committee on National Defense was appointed by President Robbins. Since the Chairman of the Committee on Education (Dr. Steer) was appointed Chairman of the Defense Committee, the following log of the Committee Program is complete.

January, 1941

The Chairman received 9 and mailed 9 communications pertaining to defense matters from his office. These communications dealt mainly with reports concerning the Washington conferences and proposals for swift follow-up action. During this month arrangements were made for listing the entire Association membership in the National Roster of Professional and Scientific Personnel maintained in Washington, D. C., by the Federal Government. As a result of this action, all members received questionnaires and Technical Check Lists relative to specialization within the field. A special committee composed of Drs. Solomon (Chairman), Blanton and Wile were delegated the task of constructing a program of proposals for the Office of the Surgeon General regarding the use of Speech Pathologists in the War Department. Also, Dr. Hawk

started preliminary investigations for employing Speech Pathologists in Veterans' Hospitals.

FEBRUARY, 1941

The Chairman of the Committee received 13 and sent 17 communications to various parts of the country. During this month the Chairman worked closely with the Special Committee appointed to submit proposals to the Office of the Surgeon General. The report was sent to Washington, D. C., on February 17, 1941.

On February 12, 1941, the President requested Dr. M. D. Steer to serve as Chairman of the Committee on National Defense of the American Speech Correction Association. On February 24, 1941, Dr. Steer resigned as Chairman of the Committee on Education (new Chairman, Dr. Martin Palmer) to enable him to devote full time to the Defense Program of the Association.

Communications between the Committee Chairman and President Robbins were conducted relative to the allotment of funds for this new Committee. It was decided to use some of the funds allotted to the Committee on Education.

The Emergency Committee of the American Psychological Association (Chairman, K. M. Dallenbach) was informed on February 26, 1941, of the existence of the Defense Committee of the American Speech Correction Association.

A response to the report submitted by Dr. Solomon's Committee to the Office of the Surgeon General was received on February 21, 1941, thanking the Association for the proposals and indicating that the report would be kept on file in the Washington Office and would be used should the need arise.

The following is a copy of the report which was sent to the Office of the Surgeon General.

Proposals to the Surgeon General's Office re Specialized Military Duties for Speech Therapists.

On January 2, 1941, Dr. M. D. Steer and Dr. D. Morris, representing the American Speech Correction Association, visited the Surgeon General's Office at which time Lieut. Col. Lieberman expressed his willingness to examine any concrete proposals which the American Speech Correction Association might care to submit. The President of the Association appointed a committee of three Fellows of the Organization to draw up the proposals which are stated below. Since each of the three committee members are certified neuro-psychiatrists, it was possible to construct proposals to coordinate the services of the speech therapists with the medical officers.

Arrangements have been made with the National Roster of Scientific and Specialized Personnel to include the membership of the American Speech Correction Association. The names of this trained personnel will be available shortly in the Washington Offices of the National Roster. It is the specific purpose of the proposals

included herewith to indicate to the Surgeon General's Office the services of this personnel so that the clinical procedures of speech therapists will be available. The Technical Check List of the National Roster for Speech Pathology will indicate the specific specialties of the individual members. It should be noted that not only are specific specialties named, but also that educational and vocational backgrounds are indicated. The American Speech Correction Association includes personnel specifically trained to survey, diagnose and treat individuals manifesting speech disorders. Most Fellows of the Organization have completed Ph.D. or M.D. degrees.

Proposals for the Selective Service Program.

A speech pathology program should be organized under the neuro-psychiatric service. Speech therapists should be made available for consulting duty for neuro-psychiatrists already established under provisions of the Selective Service Act. Under such an arrangement the medical officer can enlist the services of speech therapists to assist in the diagnosis of speech defects manifested by selectees. This service would be of particular value in instances of suspected malingering.

A. Local Boards.

According to Selective Service Regulations, Physical Standards, volume VI, section XIX, p. 28, item 76, a selectee is to be placed in Class I-B if "stuttering and stammering of a degree disqualifying for general military service but which has not prevented registrants from successfully following a useful vocation in civil life" is manifested. According to item 77-g, a selectee is rejected if "stammering to such a degree that the registrant is unable to express himself clearly or to repeat commands" is present. In section VI, item 28-b, a selectee is placed in class I-B if there is manifested "aphonia with attendant conditions, which disqualify for general military service, if they have followed a useful vocation in civil life." A selectee is placed in class 4 if irremediable defects of mouth, throat, or nose interfere with speech.

It is seen from the above statements that local medical boards are called upon to make decisions relative to speech defects. It would be highly desirable to have a speech therapist available for all local boards, but since the large number of these boards prohibits this possibility, it is proposed that a listing of qualified speech therapists be made available so that local medical boards may request professional opinion.

It has been the experience of Dr. Smiley Blanton, a member of this Committee who served for two years in the Neuro-psychiatric Corps (1917) that there should be someone to assist in the selection of inducted men manifesting speech defects. He found two types—those with so much oral inactivity that they could not be understood (he trained a number of this type at Fort Slocum); those with a definite stutter.

Another member of the Committee, Dr. Ira S. Wile, has stated, "Members of the American Speech Correction Association should be able not merely to facilitate the determination of the speech deficiencies of selectees, but also to aid in determining which speech difficulties should or should not be reason for rejection."

B. Induction and Training Camps.

According to the official statement of the Physical Standards publication, the final decision as to the acceptance or rejection of men rests with the examining physicians at induction stations. "Speech defects" are listed among the disqualifying defects at the induction stations.

Speech therapists should be assigned to work in conjunction with medical boards at induction stations. Their duties at such a post would include:

1. Professional opinions to medical officers when requested.
2. Assistance in the determination of speech malingering.
3. Survey of incidence of speech disorders at induction stations and rejections made through local boards.
4. Determination of selectees manifesting speech defects not previously indicated at local or induction stations.
5. Assistance, under the direction of medical officers, in therapy for newly manifested speech defects.
6. Organization of research directed toward:
   (a) prediction of speech defects among army personnel,
   (b) establishment of tests and measurements for speech needs for army services,
   (c) determination of suitable therapies for specific speech defects manifested by inductees,
   (d) manipulation of mental hygiene for speech defectives under supervision of medical officers.

In summary, it would be advisable to assign a speech therapist to the major training camps for the purpose of working with medical groups, not merely in making speech surveys, but in facilitating such remedial service as might be indicated.

C. Military Hospital Services (Army, Navy, Marine, Veteran).

The speech therapist should be made available as a consultant and for other services under the neuro-psychiatric division of the medical corps. These same services should be made available for medical officers attending otolaryngological problems at the various hospitals.

The speech therapist should be assigned to duty in Army, Navy, Marine, and Veteran's hospitals for the definite purpose of offering therapy to members of the force exhibiting disabilities involving speech, whether dependent upon impairment of hearing, organic pathology, or upon neurotic factors. It is to be understood that

where there is organic pathology, remedial work would follow consultation with the attendant physicians or psychiatrists. It has been found that soldiers experiencing shell shock and other conditions due to combat service also often develop speech defects[1] and that those who treat them must be very familiar with pathological speech conditions.

Below are listed the possible services of speech therapists assigned to hospital duty.

1. Survey of speech defects appearing in the various hospitals.
2. Professional opinion to medical officers when requested (especially valuable with suspected malingering).
3. Speech therapy under regulations established by medical corps. Speech therapy would be indicated usually in the following conditions:

I. Dysphemia: variable defects of articulation found in neuroses.
   A. Hysterical mutism.
   B. Neurotic lisping.
   C. Stammering, stuttering.

II. Dysphrasia: disorders in the expression of ideas due to psychoses.
   A. Voluntary mutism.
   B. Echo speech.
   C. Flight of ideas.
   D. Interpolations.
   E. Loquatiousness.
   F. Perseveration.
   G. Taciturnity.

III. Aphasia (including agraphia, alexia, agnosia, apraxia, etc.).
   A. Sensory Aphasia.
      1. Agraphia (sensory).
      2. Agnosia.
      3. Word-blindness.
      4. Word-deafness.

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[1]Raymond, E. M. *What the Government is Doing for Soldiers with Speech Defects.* Quart. Jour. of Speech Education, Vol. 7, No. 1 (February), 1921.

Yealland, Lewis R., M.D. *Hysterical Disorders of Warfare.* Macmillan & Co., Limited, St. Martin's Street, London, 1918.

Eder, M.D. *War Shock.* P. Blakiston's Son & Co., 1917.

Southard, E. E., M.D. *Shell Shock and Neuropsychiatry.* W. M. Leonard, 1928.

Porter, W. T. *Shock at the Front.* The Atlantic Monthly Press, Boston, 1918.

Miller, Emanuel, ed. *The Neuroses in War.* The Macmillan Co., 1940.

B. Motor Aphasia.
   1. Agraphia (motor).
   2. Articulatory aphasia.
   3. Apraxia.

C. Amnesia Aphasia.

D. Semantic Aphasia.

IV. Dysarthia: disorders of articulation due to lesions of the nervous system.
   A. Ataxic speech.
   B. Atheroid speech.
   C. Bulbar speech.
   D. Choreatic speech.
   E. Scanning speech.
   F. Spastic speech.

V. Dyslogia: defects of articulation and of language due to feeblemindedness.
   A. Elisions.
   B. Gibberish.
   C. Idiotic mutism.

VI. Dysaudia: defects of articulation due to impaired hearing.
   A. Deaf-mutism.
   B. Elision of surds or high-frequency consonants.
   C. Substitutions.

VII. Dysglossia: defects of articulation due to structural anomalies.
   A. Cleft-palate speech.
   B. Organic lisping.

VIII. Dyslalia: functional defects of articulation.
   A. Elision.
   B. Foreign dialect.
   C. Provincial dialect.
   D. Mumbled speech due to oral inactivity (lalling).
   E. Sound substitutions (lisping).

IX. Defects of voice quality.
   A. Hysterical aphonia.
   B. Hoarseness.
   C. Monotone.
   D. Nasality.

Speech therapists under the supervision of medical officers should be assigned to duty in military hospitals to assist in survey, diagnosis, and rehabilitation of men whose speech involvements indicate the need for such specialized service. Such services would relieve medical officers for other specialized duties.

Further Considerations.

There would be an advantage in having a committee of speech therapists appointed to set up some definite research problems for investigations that would be of service to the army, navy, and marine corps. Such research investigations relating to prediction and prevention of speech defects might result from such a program.

The experience gained by speech therapists in connection with present military training programs would enable the Surgeon General's Office to secure a better idea of the necessities and possibilities of a program under war conditions involving a less rigorous program of rejection.

It should be pointed out to the Surgeon General's Office that a special committee of the American Speech Correction Association has been requested to submit proposals for civilian speech rehabilitation programs to the director of the National Health and Fitness Defense Program Committee. Through the operation of such a program, it is hoped that many of the eligible selectees will reach local and induction boards free from speech defects.

March, 1941

During March, 1941, the Defense Committee Chairman received five communications and mailed eight from his office. These communications involved the following business: (1) Suggestions to the Emergency Committee of the American Psychological Association; (2) Formation of the complete Committee and Sub-committees of the American Speech Correction Association; and (3) Attempts to arrange a Committee meeting to be held in May, June or July at some central mid-western city for the purpose of formulating a Defense Program Policy for the Association. The Chairman of the Committee discussed problems concerning general policy and specific problems with Sub-committee Chairman of Selective Service (Dr. Ira Wile) and Veterans' Hospital Bureau (Dr. Smiley Blanton) in separate conferences in New York City during the week of March 22, 1941.

April, 1941

Nine communications were received and seven were sent from the office of the Committee Chairman during this month. The principal business concerned: (1) A letter requesting information relative to current speech problems in England sent to the Director of the British Library of Information in New York. The response indicated that no information was available but that perhaps it could be obtained by writing directly to English Speech Pathologists; (2) Policy and Philosophy for our Defense Program was mailed to President Robbins on April 18; (3) Recommendations to President Robbins suggesting the formation of a special Defense Publication Board to keep members informed of the Defense Program activities; (4) Initial proof that speech defectives (stutterers) were being taken

into the Army through Selective Service; (5) Dr. Blanton forwarded a letter from Charles M. Griffith, Medical Director, Veterans' Administration, Washington, D. C., indicating that Speech Pathologists were not needed currently for work in Veterans' Hospitals because "At the present time no problem exists. . . . ", "A record will be made of your very kind offer and if need arises, this offer will receive further consideration;" (6) Completed formation of Committee on Defense and all Sub-committees were appointed; (7) Statistical analysis was made from the "Statistical medical report on the physical examination of registrants up to and including the third induction period (New York City area) which ended January 31, 1941." This report indicated that rejection of selectees was made as follows: Local Boards rejected (I-B) four cases of Aphonia and nineteen cases of Stuttering and completely rejected (4-F) nine cases of "stammering." Of men approved by Local Boards the following were caught and rejected at Induction Station: 1 Aphonia (I-B) and 1 Stammerer (4-F). These reports indicated that about three-tenths of one percent (.3%) were being assigned to Class I-B (Qualified for Limited Military Service) and Class 4-F (Disqualified for Military Service) because of speech disorders; (8) Dr. Ira Wile informed the Chairman that 6.2 men per thousand were rejected from military service in the Civil War because of speech defects (classified in Government Publication under Diseases of the Jaw).

MAY, 1941

During this month the Chairman received 22 and mailed 35 communications. The principal business included: (1) The University of Iowa Speech Clinic made arrangements to cooperate and serve the Des Moines Selective Service Medical Examiner; (2) A special communication (Report I) was constructed by the Chairman and mailed to all members and sub-committee members of the Committee on Defense; (3) A communication from Dr. Milisen of Indiana University indicated that one of his stutterers was now in the Army and "fitting into Army routine well;" (4) Dr. Paul Moore of Northwestern University wrote that one of their stutterers was inducted into the Army; (5) An attempt was made to set a June meeting date for the Committee. It was found impossible to arrange a suitable date or meeting place for the entire Committee; (6) A letter was sent by the Chairman to a Minnesota Local Selective Service Board requesting deferment for a graduate student in Speech Pathology at one of the mid-western universities; (7) The following information was received from Colonel R. Hitchcock, Indiana State Director of Selective Service System:

> "The majority of registrants rejected for speech defects have had other things wrong with them, so that they would usually not qualify for general military service, even though the speech defects were corrected.
>
> Ten men have been rejected at the induction station out of 14,400 sent, for speech and oral defects such as stuttering,

cleft palate, harelip, esophageal stricture, oral nasal fistula, etc. About 0.3 per cent of 43,000 men examined by local boards have been qualified for limited miiitary service or disqualified for any military service because of similar defects."

(8) The following communication was sent from England by Elsie Fogerty on May 28, 1941:

"I was delighted to get your letter. The information you need is all in my hands and I will as quickly as possible forward you an answer to the questions your letter contains, and a memorandum on the whole position of Speech Therapy in this country, with reference to the principal books in use and the chief organizations.

I am writing to you on the morning after your President's wonderful speech for which the world will forever stand in his debt."

(9) Plans were made with the Indiana Headquarters of Selective Service to offer speech rehabilitation to selectees rejected because of speech defects; (10) The Chairman held a conference with General Hershey, National Director of Selective Service System.

JUNE, 1941

During June three communications were received and seven were sent from the office of the Committee Chairman. Business conducted included the following: (1) Dr. Margaret Hall submitted suggestions for a pamphlet on Detecting Speech Defects for the Selective Service Boards. The task of constructing this pamphlet was accepted by Dr. C. Strother of the University of Iowa; (2) Evaluation of the statistics on rejected selectees was determined via mail in correspondence between the Chairman and Dr. Ira Wile, Chairman of the sub-committee on Selective Service; (3) Stationery for the Committee on National Defense was placed on order with the Secretary of the Association; (4) Further effort was made to complete a plan for rehabilitating rejected speech defective selectees in Indiana; (5) The Chairman talked on Speech Disorders in the National Emergency at the University of Iowa Summer Session Conference.

JULY, 1941

Three communications were received and none were sent from the Chairman during July. This restricted activity was caused by changes in address and absences from the various campuses because of Summer Sessions. Business completed this month included: (1) Printing of Committee stationery; (2) Recommendations to President Robbins that Defense Committee News be published; (3) Attempts by the Chairman to have conferences with Dr. Wile and Dr. Blanton while he was in New York City on a lecture trip. Both Committee members were out of the city.

AUGUST, 1941

No communications were received or sent during the month of August. The Chairman was on vacation in Colorado. During the trip, the Chairman discussed with Dr. Strother (at Iowa City) the need for and the type of pamphlet desired for Selective Service Medical Boards.

SEPTEMBER, 1941

Twelve communications were received and nineteen were sent by the Committee Chairman. The business conducted included: (1) A message to all Chairmen of Sub-committees requesting a report covering (a) studies completed, (b) tasks to be studied, and (c) recommendations concerning changes in Policy for the Committee on Defense of the A. S. C. A. It was indicated that these reports would be submitted at the Business Meeting of the A. S. C. A. during the annual convention in Detroit. This communication was sent on September 4; (2) Arrangements were completed for the Committee on National Defense to participate on the Program of the joint session with the N. A. T. S. on Tuesday, December 30, at 11:30–12:30. These arrangements were made with the assistance of Professor Harry Heltman; (3) Error in the printing of Committee stationery (omission of Dr. Koepp-Baker as Chairman of the Sub-committee on Standardization of Therapy) was indicated to the Chairman by President Robbins; (4) Dr. Strother recommended that Dr. Wendell Johnson assume responsibility for constructing the pamphlet for Selective Service; (5) Dr. Wendell Johnson agreed to conduct basic research studies to establish tests to detect malingering in "Stutterers;" (6) Dr. Strother recommended that the Committee be requested to be present at the Detroit convention one day early for the purpose of conducting Committee business; (7) A letter was received from Dr. Simon of Northwestern University indicating that "one of our clinic cases was drafted last April and is now in the Army. A recent letter from his sister asks whether there is anything we can do to urge his discharge or, at least temporary release?" The Chairman indicated to Dr. Simon on September 25 that "at the present time we have no immediate method for securing the release of the inductee." However, this matter was followed up as noted in the October Report; (8) Dr. Wile received the following answer in response for information concerning the number of rejected selectees (both I-B and 4-F) addressed to the National Headquarters of Selective Service, Washington, D. C.: "At the present time no information is available as to the number of registrants rejected because of speech defects; however, an analysis is being made of all reports of physical examinations from which it will be possible to determine the number and geographical distribution of all registrants rejected from military service for speech defects." Dr. Wile asked the Washington office to keep him informed of the progress of the study; (9) Dr. Morris was requested to submit a report which he was to compile relative to the National Health and Fitness Programs

(under the direction of Paul McNutt); (10) The Chairman asked Professor Heltman (Convention Program Chairman) to attempt to get Paul McNutt, General Hershey or Dr. Dallenbach (Chairman, Emergency Committee, A. P. A.) for our conference program.

OCTOBER, 1941

The Chairman received 13 and sent 18 communications from his office. The business included: (1) A statement from Sub-committee Chairman of Veterans' Hospitals, Dr. Blanton, that as yet he has been unable to obtain favorable action from Washington officials; (2) Dr. Hawk reported her effort to get cooperation from Veteran Hospital officials on the West Coast; (3) The Chairman wrote to all members of the Committee for suggestions relative to the Government Plan to rehabilitate the 20% of registrants rejected because of not meeting the required Physical Standards; (4) Professor Heltman informed the Chairman that he wrote to Paul McNutt inviting him to appear on the Program at the Detroit Convention; (5) The Chairman sent another letter to Elsie Fogerty in England requesting the report she promised to submit in her May communication. A second letter from Elsie Fogerty was mailed on June 17 in which she stated, "You will be receiving my report within a few days, as it has been rather difficult to collect the information. . . ." No report has been received from England up to the present date (November 17, 1941); (6) The Chairman wrote to General Hershey on October 10 requesting information relative to the number of registrants rejected because of speech defects. The following communication from General Hershey's Office was mailed on October 17, 1941:

Subject: Registrants who have been rejected because of speech defects.

DEAR DOCTOR STEER:

"Your letter of October 10 to the Director, relative to data on registrants who have been rejected because of speech defects, has been received.

The analyses of the reports of physical examinations are not complete at this time, but a sampling of 20,000 reports show that .3% of all rejections were for functional disorders of expressive movements.

This sampling was taken at random, covering reports from all parts of the United States, and we have been using it for projection purposes. To date it is estimated there have been 1,000,000 men rejected by Local Board examining physicians and at induction stations.

When the studies of all rejected registrants are compiled, we shall be glad to make those sections available that are of interest of your committee."

For the Director:
CARLTON S. DARGUSCH,
Lt. Col., JAGD,
Deputy Director.

(7) Dr. Wendell Johnson informed the Chairman that he was proceeding with the research studies to develop tests to detect "malingering;" (8) Dr. Simon of Northwestern University submitted a detailed letter concerning Private Lloyd . . . who wrote to his former Speech Clinic that "I can notice a change for the worse already, and I am afraid by the time my year is up, it will be much worse. Everything is done in a different way than in civilian life. I guess this way of living is making me nervous. . . . " Dr. Simon requested the Chairman to attempt action on this matter. A copy of Dr. Simon's letter was attached to a special letter sent to the Surgeon General of the Army and to General Hershey, Director, Selective Service System. These communications were mailed on October 27, and answers were received as indicated in the November Report.

NOVEMBER 1–10, 1941

This report is being written during the middle of November. Consequently, a full report for this month is not possible. As per the dates noted above, the Chairman has received eight and sent two communications. The business included the following: (1) Dr. Morris arranged to consult with the Chairman relative to constructing proposals to be sent to Paul McNutt, Chairman, National Health and Fitness Programs; (2) The following letter from the Office of the Surgeon General relative to the case of Private Lloyd ——— was received by the Chairman:

November 4, 1941.

"The Surgeon General directs me to acknowledge receipt of your letter of October 27, 1941, with inclosure (copy of letter dated October 23, 1941, from Dr. Clarence T. Simon) on behalf of Private Lloyd ———, and to inform you that it is not the policy at this time to retain soldiers on active duty status who manifest stammering to such a degree that they are unable to express themselves clearly or to repeat commands and those cases that were accepted at our induction centers should be separated from the service should the above condition be present. In the future should the policy of the War Department be changed, your letter will be on file in this office for reference."

Very truly yours,

P. S. MADIGAN,

Lt. Colonel, Medical Corps, Assistant.

(3) The Chairman arranged for a conference with Lieut. Commander C. M. Louttit of the Psychological Service (Navy Surgeon General's Office) relative to Speech Therapy Programs for the Navy; (4) Concerning the case of Private Lloyd ———, the following letter (dated November 7, 1941) was received from General Hershey, Director, Selective Service:

DEAR DOCTOR STEER:

This will acknowledge your recent letter regarding Private Lloyd ———.

After induction a registrant is under the jurisdiction of the War Department. Any soldier who claims grounds for separation from active service should make his request, in writing, to his immediate commanding officer, who will forward the same to the military authority designated to receive and to act upon such request.

We are enclosing a copy of Memorandum to All State Directors (I-247), which outlines the procedure followed by the War Department, in conjunction with the Selective Service System, for the separation from active duty of soldiers now in active service. We have, therefore, transmitted your communication, together with accompanying enclosure, to The Adjutant General for appropriate action, since this soldier is under the jurisdiction of the War Department.

Sincerely yours,

L. B. HERSHEY, *Director.*

(5) Answers were received from Committee members relative to the October communication regarding advisable policy to be followed concerning the new Government Plan to rehabilitate rejected registrants. The members of the Committee apparently were divided on one main issue—some believed the matter should be discussed or planned through the American Medical Association and other members suggested different plans of action. No decision has been reached on this matter.

The Chairman of the Committee on National Defense believes that much has been accomplished since January 1, 1941. Though no active program using speech therapists in defense positions has been achieved, much of the necessary planning has been developed. Perhaps more would have been accomplished in terms of concrete programs if this planning had been completed during the previous three to six years (as was the procedure in Medicine and other allied professions). The Chairman is not contented with the results obtained thus far by the Committee on National Defense. The principal problems which must be solved include (1) arrangements for frequent (monthly or quarterly) meetings of this important committee to secure more speedy action and make the necessary decisions more effective, (2) establishment of the duties and policies so that the entire committee membership can function, (3) provisions for keeping the Association's membership informed of important professional defense news by frequent publications in the Journal of Speech Disorders, (4) plans for a budget to permit the Committee to function effectively, and (5) the addition of "new blood" on the Committee to serve as a stimulant for future action.

This report has been printed without having been inspected by all the members of the Committee on National Defense. Such procedure was necessary because of the limited time permitting for presenting it to the Editor.

DR. M. D. STEER, *Chairman,*
Committee on National Defense.

November 17, 1941.

SEVENTH ANNUAL CONFERENCE

OF THE

AMERICAN SPEECH CORRECTION ASSOCIATION

IN

JOINT MEETING

WITH THE

NATIONAL ASSOCIATION OF TEACHERS OF SPEECH

Hotel Statler

Detroit, Michigan, December 29-30-31, 1941

PROGRAM

Monday Morning, December 29th

8:30. Registration opens

9:30. Joint General Session of the A.S.C.A., N.A.T.S. and A.E.T.A.

(1) Address, W. HAYES YEAGER, President of N.A.T.S.

9:40 (2) Objectives and Standards
MARIAN L. STEBBINS, President of A.E.T.A.

9:50 (3) Educational vs. Technical Procedures in Speech Correction
SAMUEL D. ROBBINS, President of A.S.C.A.

10:00 Music

10:30 Demonstration of Voder
J. O. PERRINS, Asst. Vice-President A. T. & T. Co.

(English Room)

TECHNICAL PAPERS

CHARLES K. THOMAS, *Chairman*

11:30 Diagnostic and Clinical Procedures in Rhinolalia
HENRY F. MOSER, University of Michigan

11:45 Apparatus for Demonstrating Nasality
LEE HULTZEN, University of Missouri

11:50 Hearing Acuity in Children
HAROLD WESTLAKE, Pennsylvania State College

12:05 Structural and Functional Development of the Pharynx
HIDE HELEN SHOHARA, University of Michigan

12:20 Application of General Semantics to a Case of Stage Fright
VELMA B. HISER, Grinnell College

Monday Afternoon

(Michigan Room)

PRESIDENT SAMUEL D. ROBBINS, in the chair

2:00 Annual Business Meeting of the American Speech Correction Association

Report of Committee on Education
MARTIN F. PALMER, *Chairman*

Monday Evening

SESSION A

PROGRAM ON SPEECH CORRECTION

(English Room)

GEORGE A. KOPP, *Chairman*

(This meeting will begin on and be held to schedule)

7:00 Speech and Voice Examination Procedures in Educational Institutions in the United States
HANNAH M. POLSTER, Ohio State University

7:10 Clinical Activities at Wayne University, with Sound Pictures in Color
EUGENE HAHN, Wayne University

7:40 The Speech Clinician and the Classroom Teacher Co-operate in a Speech Correction Program
MYFANWY E. CHAPMAN, Minneapolis Public Schools

8:00 Intermission

8:10 Demonstration of a Regular 30-Minute Class Period with a Class of Stutterers
HELEN SHEKELL, Detroit Public Schools

9:00 Therapeutical Analysis of a Case Study of a Stutterer. Presentation of the Case
C. VAN RIPER, Western State Teachers College

9:15 Symposium on a Plan of Clinical Therapy
EMIL FROESCHELS, New York City
WENDELL JOHNSON, Iowa State University
MABEL F. GIFFORD, California State Department of Education
SAMUEL D. ROBBINS, Emerson College
JAMES F. BENDER, Queens College
ALICE CHAPIN, Los Angeles Public Schools

Each person will speak five minutes on a plan for clinical therapy for the case presented

9:45 Discussion

10:00 Adjournment

SESSION B

TECHNICAL PROGRAM ON SPEECH DISORDERS

(Michigan Room)

CHARLES R. STROTHER, *Chairman*

7:00 A Professional Seminar—PART I

Organic Variations of the Peripheral Mechanism and Their Clinical Implications in the Dyslalias

HERBERT KOEPP-BAKER, Pennsylvania State College

Tuesday Morning, December 30th

PROGRAM ON SPEECH CORRECTION

(Michigan Room)

DELYTE W. MORRIS, *Chairman*

(This meeting will begin on and be held to schedule)

9:00. The Program of State Aid for Speech Correction in Michigan

JOHN S. HAITEMA, Michigan State Department of Education

9:20. Symposium on Unique Cases of Speech Disorders

JAMES F. BENDER, Queens College
HENRY F. MOSER, University of Michigan
LEE E. TRAVIS, University of Southern California
SARA STINCHFIELD HAWK, University of Southern California
BRYNG BRYNGELSON, University of Minnesota

Each speaker will have five minutes to present his case

9:45 Discussion

10:00 Relationship Between Medical Men and the Speech Correctionists

DR. DELL HENRY, University of Michigan

10:20 Discussion

Tuesday Afternoon

SESSION A

PROGRAM ON SPEECH CORRECTION

(English Room)

JANE TAYLOR, *Chairman*

3:00 Problems in Speech Correction in the Public Schools

HAZEL DU CLES MILLER, Kenilworth and Wilmette Public Schools

Panel Discussion
(Personnel to be selected)

SESSION B

(Michigan Room)

TECHNICAL PROGRAM ON SPEECH DISORDERS

LEE E. TRAVIS, *Chairman*

3:00 A Professional Seminar—PART II
Organic Variations of the Peripheral Mechanism and Their Clinical Implications in the Dyslalias
HERBERT KOEPP-BAKER, Pennsylvania State College

Tuesday Evening

(Grand Ball Room)

6:30 Joint Banquet—A.S.C.A. and N.A.T.S.

8:00 SPEECH IN NATIONAL DEFENSE
PRESIDENT HAYES YEAGER, *Chairman*

8:00 "The Civilian in National Defense"
Speaker to be announced

8:30 "The Function of Speech in National Emergency"
Speaker to be announced

9:00 "The Problem of Defective Speech in National Defense"
M. D. STEER, Purdue University

9:30 Business Meeting of the A.S.C.A.
(Michigan Room)

Wednesday Morning, December 31st

PROGRAM ON SPEECH CORRECTION

(Michigan Room)

LETITIA E. RAUBICHECK, *Chairman*

(This meeting will begin on and be held to schedule)

9:00. Some Relationships Between Voice and Personality Among Fundamentals of Speech Students
MELBA HURD, University of Minnesota

9:15. Auditory Memory Span for Speech Sounds. Comparison of Normal and Speech Defective Children
RUTH WATT METRAUX, University of Michigan

9:30. Symposium on Unique Cases of Speech Disorders

WENDELL JOHNSON, Iowa State University
H. J. HELTMAN, Syracuse University
EMIL FROESCHELS, New York City
ROBERT MILISEN, Indiana University
PAUL MOORE, Northwestern University
MARGARET HALL, Chicago Public Schools

Each person will speak for five minutes on "The Most Interesting Case I Have Known"

10:00 Discussion

10:10 Symposium on Clinical Failures in Specific Cases

C. VAN RIPER, Western State Teachers College
CLARENCE T. SIMON, Northwestern University
MARTIN F. PALMER, Wichita University

Each speaker will have ten minutes for a statement on "My Most Serious Failure in Speech Therapy"

10:40 Discussion

TECHNICAL PAPERS

(Michigan Room)

BRYNG BRYNGELSON, *Chairman*

(This meeting will begin on and be held to schedule)

10:45. Learning to Speak After Six and One-half Years of Silence
MARIE K. MASON, Ohio State University

11:00. The Speech Examination of Aphasic Patients
JEANETTE ANDERSON, University of Wisconsin

11:15. Re-Education of Aphasics
MARY HUBER, Children's Memorial Hospital, Montreal, Canada

11:30. Discussion

11:35. Social Attitudes of Stutterers
HENRIETTA HULL, Indiana University

11:45. Effects of Muscular Exercise on Stuttering
JAMES F. CURTIS, University of Iowa

12:00. Cardio-Vascular and Metabolic Study of Stutterers and Non-Stutterers
CARL RITZMAN, University of Iowa

12:20. Discussion

12:30 A.S.C.A. Luncheon

Wednesday Afternoon

SESSION A

PROGRAM ON SPEECH CORRECTION

(English Room)

HILDRED GROSS, *Chairman*

(This meeting will begin on and be held to schedule)

1:30. Effect of Maturation upon Defective Articulation in the Elementary Grades
VIVIAN ROE, Fort Wayne Public Schools

1:45. A City and County Speech Re-Education Program
J. ADELBERT YOUNG, Superior, Wisconsin, Public Schools

2:00. Discussion

2:05 Intermission

2:15 Demonstration of a Regular Thirty-Minute Class Period with Children with Articulatory Defects
ANNE M. THORNE, Dearborn Public Schools

2:45 Discussion

3:00 Therapeutical Analysis of a Case Study—An Articulatory Defection
Presentation of the Case
HARLAN BLOOMER, University of Michigan

3:15 Symposium on a Plan of Clinical Therapy for the Case
CLARENCE T. SIMON, Northwestern University
WILBUR E. MOORE, Central State Teachers College
DOROTHY DAVIS TUTHILL, Brooklyn College
LETITIA RAUBICHECK, New York Public Schools
MACK D. STEER, Purdue University
MARTIN F. PALMER, Wichita University

Each person will speak for five minutes on a plan of clinical therapy for the case presented

3:45 Discussion

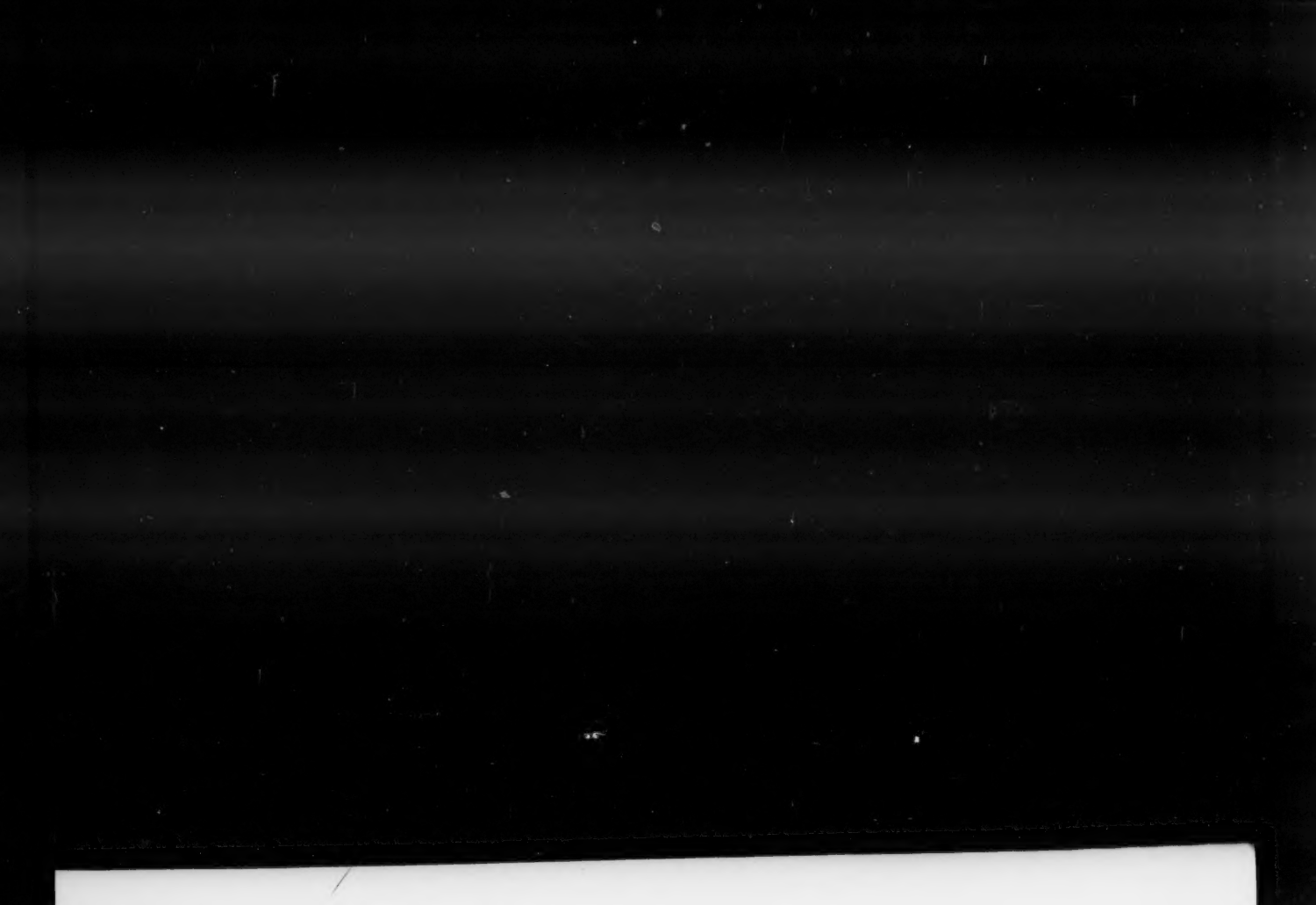
4:00 Adjournment

SESSION B

TECHNICAL PROGRAM ON SPEECH DISORDERS

(Michigan Room)

CLARENCE T. SIMON, *Chairman*

1:30 A Professional Seminar—PART III
Organic Variations of the Peripheral Mechanism and Their Clinical Implications in the Dyslalias
HERBERT KOEPP-BAKER, Pennsylvania State College

4:30 Adjournment